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The
Home Garden Handbooks

ROCK GARDENS

**BOOKS BY
F. F. ROCKWELL**

**AROUND THE YEAR IN THE GARDEN
THE BOOK OF BULBS
THE HOME GARDEN HANDBOOKS**

IRISES

LAWNS

SHRUBS

DAHLIAS

GLADIOLUS

ROCK GARDENS

EVERGREENS FOR THE SMALL PLACE

The
Home Garden Handbooks

ROCK GARDENS

BY

F. F. ROCKWELL

AUTHOR OF "AROUND THE YEAR IN THE GARDEN,"
"THE BOOK OF BULBS," ETC.

Drawings by

GEORGE L. HOLLROCK AND THE AUTHOR

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TO

MONSIEUR HENRI CORREVON,

*who, from his native Switzerland, has
carried the message of beauty from
little plants around the world.*

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HOW TO USE THIS BOOK

THIS is one of the Home Garden Handbooks. Like its companion volumes in the series, it is planned to give, in as few words as possible, the information needed to enable you to succeed with one important garden task. In the present volume, the new—to America—and fascinating work of rock gardening is discussed.

No photographs are reproduced in this book. There are two reasons for this: first, the author feels that the points in the text which really need illustrating can be explained more clearly in drawings than by photographs; secondly, by omitting photographs it is possible for the publishers to give you the information which this book contains at a much lower price.

THIS BOOK IS DESIGNED TO SERVE PRIMARILY AS A SUPPLEMENT TO YOUR SEED AND NURSERY CATALOGS, in which you will find illustrated, often in color, not only the varieties mentioned in these pages but the host of new plants especially adapted to rock-garden making and planting, which are now being rapidly introduced by seed houses and specialists in rock plants and alpine. Therefore, it should be studied and used in connection with your catalogs—the opening chapters, with their suggestions on how to plan and construct your rock garden, long before you make out your orders for plants and seeds; and the succeeding chapters on how to plant and care for them, as your visioned rock garden gradually becomes a reality.

The greatest care has been taken to make the index as complete as possible so that the reader may find immediately all the information which is given on any particular point, even though it may be referred to in several places in the book. Get the habit of consulting your Home Garden Handbooks while you are doing the work!



ROCK GARDENS

INTRODUCTION

BY LOUISE BEEBE WILDER

Author of "Adventures In My Garden and Rock Garden"

THE request for a few words by way of introduction to a new book on rock gardening comes to me at a season when, more than at any other, it seems to me, one is alive to the fascinations of this special phase of the craft. It is early December and we have been going about the narrow paths in the pale sunshine putting the plants to bed; tucking good gritty soil about the throats of such of our charges as fear the damp and drawing on the warm winter blanket of salt hay. Even at this chill eleventh hour there are many blossoms sparkling defiance at our attempt to sound the curfew, and one is struck anew with the beauty of the small mounds and hillocks and trailing masses of gray or blue-green foliage that characterize so many of the rock plants. At every turn of the way we are reminded of the unfailing pleasure and interest derived from this small special area during the past ten months, and we are confident that in February, possibly even in January, there will be stirrings and awakenings beneath the enveloping blanket. The rock gardener's dormant season is most happily short.

The growing of alpine and rock plants in gardens especially made for them is rather a new activity among American garden lovers, though it has long been practiced in England and in Europe generally, where it has been brought to a high state

of perfection. We have been too busy learning to "garden finely" along other lines. Ten years ago there were few rock gardens in this country; to-day they are springing up on every hand, not all of them things of beauty as yet, not all of them well made, but all testifying to the rapidly growing interest in this type of gardening and in the little plants of hills and mountains to which it is largely devoted.

Nor is there anything surprising in this state of affairs. A rock garden offers equally to the estate owner and to the small lot owner the opportunity to use his imagination, to exercise his skill and to indulge the collector's instinct which is inherent in all good gardeners. Once the possessor of a little suburban plot was condemned to a narrow round of a few annuals and perennials, a rosebush or two, a few shrubs. To-day, by means of his rock garden, his plot, whatever its size, becomes a miniature world and his feet are set in the paths of adventure.

Mr. Rockwell, in providing a guide to these adventures, has rendered a service to American rock gardeners, present and prospective. His book goes forth with my warmest good wishes and the certainty that it will make for itself many friends.

CHAPTER I

WHAT THE ROCK GARDEN OFFERS

ROCK GARDENING has been termed the most intriguing of all forms of gardening.

Certain it is that it possesses a fascination of its own: and that in recent years more and more persons have been caught by the spell of it, and are seeking information concerning both the why and the how of rock gardening.

What is a rock garden?

It is logical to assume that it is a garden in which rocks are a prominent feature.

And yet that description is hardly definite enough. For although rock gardening is a comparatively new type of gardening, and is as yet less well defined than other types, nevertheless the term "rock gardening" has already come to mean not only a garden built with rocks, but also a particular style of gardening, employing plants of certain kinds and with definite characteristics.

It is true that there are many different forms of rock gardens. They vary in size from a few square feet to acres in extent. In conception and execution they also range from those of greatest simplicity to those intricately elaborate; and, incidentally, in cost from a few dollars to hundreds of thousands. But any real rock garden worthy of the name may be immediately identified as such, whether it graces a corner of the grounds of the most modest cottage or the sloping hillside of a millionaire's estate.

And yet one may spend hundreds or even thousands of dollars in piling up stones and setting out plants, without achieving a rock garden. Rocks and plants alone, no matter how prodigally provided, will not assure the creation of the thing we are after.

The first essential of a real rock garden—no matter on what scale it may be built—is that it shall look natural.

Any attempt which falls short of this becomes at best merely a collection of rock plants, which is very different indeed from a rock garden. And it must be kept in mind that a formal rock garden is a contradiction in terms—"there ain't no sich animile!"

ROCK GARDENS FOR SMALL PROPERTIES

Fortunately this essential effect of naturalness in rock garden making is not wholly, or even primarily, dependent upon the size of the garden. It is true that with plenty of room to work in, one may produce results which upon a very small scale would not be possible. And yet a truly charming rock garden may be built within a very limited area. At some of the recent flower shows, there have been a few excellent examples of rock gardens covering but a few square yards of exhibition space—even though it must be admitted that most of these displays labeled "rock gardens" are anything else but!

And here and there one comes across a real-life planting which demonstrates that a very small but genuine rock garden is a possibility. These are not as yet numerous, it is true; but they are sufficiently frequent to prove that it can be done. The many small rock gardens which one sees, unsatisfactory from an artistic point of view, are the result of lack of information, or of taste, on the part of the gardener, rather than of any real difficulties in the way of planning or planting.

Rock gardening, as a matter of fact, is in many ways particularly adapted to the beautification of very limited areas. With a suitable selection of materials and plants, it may be made the most miniature of any form of gardening; and yet it is in no sense toy gardening, for the smallest rock garden may possess dignity, character, and charm.

And rock gardening is perhaps the most *intimate* of all types of gardening; probably in no other does the gardener become so well acquainted with his plants, or enter into such close association with them.

The plants themselves, with few exceptions, possess strong individualities. They do not have such huge nor such gor-

geous colored blooms as most of the flowers with which we are more familiar. In fact, many of them have but tiny blossoms and depend upon a mass of these to produce the wonderful splashes of color which they bring to the garden picture. Others develop the charm which they hold for most people only upon fairly close acquaintance, but unquestionably they do develop it. Their quaintness, their hardiness, their infectious cheerfulness, their shyness,—or frankly bold assertiveness, despite their miniature size,—are qualities which give them a *personality* not possessed to the same degree by any other group of plants.

It is undoubtedly the fascination which these little plants themselves possess, as well as the possibility of using them, in connection with rocks, to create beautiful garden pictures, that has given rise to the present astonishing interest in rock gardening.

This interest is not a passing vogue, or garden style. Rock gardening, while its popularity is comparatively recent, is a sound, sensible, and wholly practical kind of gardening, which is certain to become more and more widely taken up and enthusiastically followed by American gardeners.

And though one may not have room for winding paths, nor possess glacier-wrought ledges and ravines, with which to make a start, it is possible to capture in much smaller space the real spirit of the rock garden. It was but a little nook of a garden, I fancy, but one where rocks had their place, in which was penned that brief but beautiful garden poem which runs:

“A Garden is a lovesome thing, God wot!
 Rose plot,
 Fringed pool,
 Ferned grot,
 The veriest school
 Of Peace;
 And yet the fool
 Contends that God is not—
 Not God! in Gardens! when the eve is cool?
 Nay, but I have a sign:
 ’Tis very sure God walks in mine.”

CHAPTER II

ROCK GARDENS OF VARIOUS TYPES

Rock gardening in America is as yet in a somewhat nebulous state. We are now making an enthusiastic beginning, but it is as yet only a beginning. Neither the results which are obtainable, nor the best and simplest methods of attaining them, have so far been worked out. Likewise when one starts to discuss the various types of rock gardens, there is little that is definite to go by. However, it is of small practical help to the beginner to suggest to him merely that he "make a rock garden"—the term is too ambiguous. And so the attempt must be made to define to some extent the various types of rock gardens from among which he will have to choose before starting in to make his own.

TYPES OF ROCK GARDENS

Size, naturally, is one of the important points in respect to which rock gardens differ. But it is to characteristics other than size that we have reference here. The size of the prospective rock garden is likely to be determined or at least limited either by the size of the area available for planting or the size of one's bank account. To that extent, this phase of the matter may take care of itself. But entirely aside from this, there are other things to consider.

The Artificial Rock Garden. In a sense all rock gardens are artificial. What is meant here by the term "artificial rock garden" is a rock garden which is definitely set apart, standing by itself as a special feature in the landscape planting, frankly artificial and making no pretense or attempt to appear as though it actually belonged there.



Such a rock garden, large or small, is a complete unit in itself. Within its own limits, of course, it must be made to look as natural as possible. Beyond that, it is just a special type of garden occupying a place in the general landscape scheme.

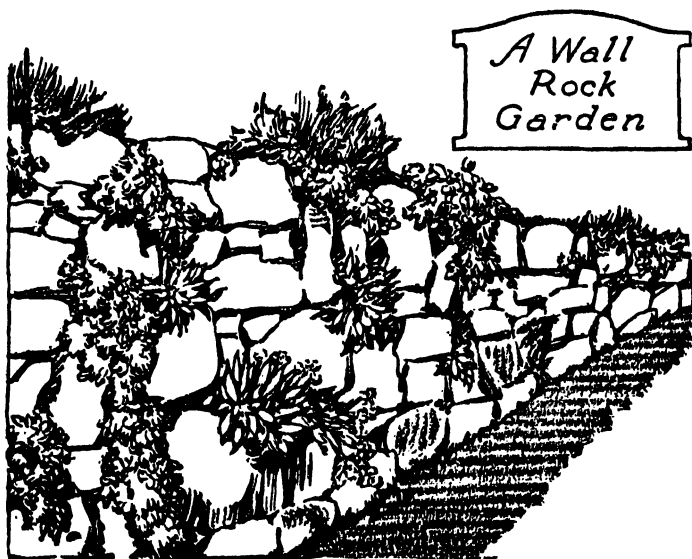
On the other hand, the attractiveness of the rock garden, even though it be an entirely artificial creation, will be greatly enhanced by giving it a setting or background of a type which will make more gradual the break between the rock garden itself and the lawn and the balance of the landscaping. This subject is discussed further in a later chapter.

The Natural Rock Garden. Fortunate, indeed, is the home owner who possesses the nature-made foundation for a rock garden. This may be in the form of an outstanding ledge of rock, a stony bank or slope, a small ravine, or it may be but a hollow or an irregular contour which, with the addition of stones, will look wholly natural. In any event, he finds himself in possession of that which even elaborate planning and the expenditure of a large amount of money cannot duplicate if it is not there to start with, and which will make it possible for him to have easily what is one of the most beautiful and, at the same time, one of the least expensive forms of flower gardens to maintain—a genuinely natural rock garden.

The Wall or Bank Garden. Still another form of rock gardening is that in which a rock wall may be utilized for the growing of rock plants. This makes it possible to have a rock garden in the least possible space, and such a wall may almost always be made to look as though it belonged, even though it may have been placed there for the specific purpose of growing rock plants. Very often it is possible to convert a steep terrace, which it has been difficult to make and difficult to maintain in sod, and which has been unsightly if not positively ugly, into a beauty spot which will attract more enthusiastic admiration than any other feature of the place.

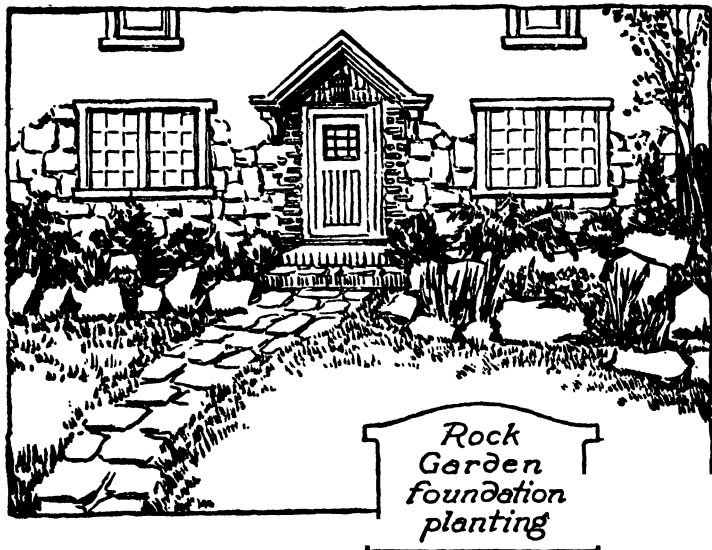
By the use of some suitable perennials in addition to alpine and rock plants, a wall or a rocky bank may be kept colorful from one end of the season to the other. The opportunity

for this type of rock gardening is probably the most generally overlooked of any. Not infrequently one sees large sums spent in eradicating or destroying banks, or putting in solid masonry walls, where a suitable wall garden might have been created at a much smaller cost. (See accompanying illustration.)



The Rock-Garden Foundation Planting. There is still another use for a modified form of the rock garden which has been but little taken advantage of. This is the rock-garden foundation planting. I have never happened to come across, in any literature on rock gardening, a reference to this form of rock gardening. But I feel sure that it will prove to be another worth-while method of using these excellent plants. I have seen a few such plantings successfully executed and have experimented sufficiently along this line myself to feel satisfied that there is a field here which has not yet been developed. In many sections where stones abound, and where ledges of rock crop out in the grounds around the house, such a planting is

entirely appropriate. It gives a change from the typical all-evergreen planting, and makes a natural-looking finish for the base of a stone or a stucco house. Moreover, in the shade of northern and western exposures, are to be found conditions wholly suited to many of the rock garden and alpine plants. Concealed watering may easily be provided. (This subject is



referred to further in Chapter IV, "Constructing the Rock Garden.") One of the accompanying illustrations shows this type of rock gardening, suggested by a planting made by the illustrator of this book. His home is built upon a rock ledge, and he had the good sense to utilize this natural formation in the foundation planting, thus attaining an effect both beautiful and unusual instead of following the usual procedure of blasting out every visible piece of stone, at great expense, to achieve in the end only commonplace results.

The Collection of Rock Plants. Sometimes the primary object of the gardener may be not so much a rock garden as a collection of rock plants. This, in itself, is a worth-while

objective, for some of these little beauties are as readily grown as any perennials, and others are captivating because of the various difficulties involved in successfully growing them. They are as well worth while as any other class of plants for their own merits and quite aside from their use as material for making a rock garden.

Often the beginner starts out with no clear idea as to whether his object is to grow rock plants or to create a real rock garden. This is one of the things which should be determined early. If you merely want to grow rock plants, stones may be used as a means for supplying suitable growing conditions. Or, for that matter, many of the rock plants, and even some of the alpines, may be grown perfectly well, especially in a slightly raised bed, without any rock anywhere in the vicinity.

Rock Gardens Versus Rockeries. While we are on this subject it may be worth while to call attention to another form of pseudo rock gardening. This is the pile of rocks, sometimes carefully built up, sometimes loosely thrown together with soil put over them, which is usually called a "rockery." Such a pile of earth and stone may serve as a support for vines, such as English ivy, to scramble over, or for some of the dry-soil annuals or perennials, such as portulaca or Iceland poppies, but is in no sense a rock garden, not even a miniature edition of one. For the whole design and purpose of a rock garden is to save and conserve the moisture in the soil well below the surface, so that the far-reaching roots of rock and alpine plants may utilize it, even though they seem to be growing in absolutely dry soil. The rockery, on the other hand, is an ideal structure for *not* saving moisture. When the spring rains are over, it will quickly dry out clear to the center, and only by repeated drenchings, which would be fatal to many rock plants and alpines, can it be kept at all moist.

Character of Design. With most kinds of gardening or landscaping, the gardener may exercise a rather wide range of choice as to treatment; that is, he may make his planting along formal, informal or naturalistic Japanese, or picturesque, lines.

With the rock garden, however, formal treatment is pre-

cluded. Neither the materials used in the construction of the rock garden, nor the plants which will occupy it, lend themselves to any formal arrangement. Straight lines, regular angles or curves, the trimmed plants, statuary, fountains, and all that sort of thing are so foreign to the whole conception of the rock garden that any attempt to introduce them would appear ludicrous. One may, however, choose between a naturalistic treatment and what may be termed "the Japanese style," the chief difference being that in the latter an effort is made *to reproduce a landscape in miniature*; this requires an excellent sense of proportion, and a knowledge and use of a wide variety of plant material. The satisfactory execution of a Japanese rock garden is much more difficult than that of a rock garden which will appear satisfactorily natural looking. Unless the services of a landscape architect are available, it is better to try the simpler form first.

SELECTING THE TYPE TO SUIT CONDITIONS

Thus it is apparent that, in planning to have a rock garden, even though it is not to be a very elaborate one, the gardener is presented the choice of a number of different types.

The first step in success with rock gardening, as with other types of gardening, is to have a definite objective before starting. It is not practical to plan a rock garden in every little detail before one begins the construction; but a fairly definite idea as to what is to be attempted there should be.

Some of the points which should be taken into consideration in determining the type of rock garden to be made are as follows:

Space Available. A rock garden may be built on a few square yards of ground, or cover a considerable area. The expense is not, necessarily, in direct proportion to the size, particularly if there are natural features of which advantage may be taken. On a small place, however, the size of the rock garden should not be out of proportion to the other units of the planting. Where outcropping ledges or rocks abound, it is sometimes possible to convert the whole place into a naturalistic

garden; where this may be done it is also the most economical as well as the most attractive of all methods of treatment.

Character of Location. Where the rock garden must be built artificially, "from the ground up," it should not be made too conspicuous. I have seen small rock gardens, fairly well done themselves, but planted squarely in the middle of the front-lawn area and looking even more out of place than the old-fashioned geometrical flower bed which has, happily, so nearly disappeared. For a small rock garden, a corner of the grounds, preferably flanked by evergreens or by a thicket of shrubs, and providing some seclusion as well as protection and shade, usually offers the best opportunity, but it may easily be made so large or so high as to seem out of place.

Time available for taking care of the rock garden is another consideration. If its construction is simple, and the plants in it are such that they will largely care for themselves, the rock garden will require very little time. A more elaborate scheme and the inclusion of varieties which easily perish or must be protected from more rampant growers, require quite as much care as any other kind of a garden.

Personal Taste. The most important thing, however, is to plant a rock garden which will please *you*. Before starting your own rock garden, you should by all means make the effort to visit several rock gardens so as to see firsthand for yourself the results which are possible. A number of the leading parks now have excellent rock gardens. Some of the nurseries specializing in rock plants have been wise enough to create small gardens on their own premises illustrating in a practical way what may be done. The various garden magazines, from time to time, illustrate good examples of rock gardening, and, almost without exception, the owners of these gardens are glad to welcome as a visitor any one who is interested in making a rock garden.

From whatever source you may get the ideas for your own rock garden, the important thing is to get them before you begin construction.

CHAPTER III

THE ESSENTIALS OF SUCCESS

IN rock gardening, as in any other type of gardening, there are certain elemental requirements which must be provided before success is to be achieved.

For the great majority of plants which are suitable for use in a rock garden, there is nothing in the way of cultural peculiarities which may cause the beginner to hesitate. Some subjects, especially among the true alpine, are admittedly difficult to handle, but there is no occasion to try these at the beginning; and even in sections where they may not be grown at all, there are so many others which will do nicely that their absence is not a serious handicap.

CLIMATE

As in other types of gardening, so in rock gardening we have taken much of our garden lore from Europe, especially from England. The English climate is entirely different from that in most sections of the United States. So for many years the supposition prevailed that rock gardening was not adapted to American conditions. The reason for this supposition was that many rock plants and alpine which thrive in the English climate were not so well pleased with the environment they found over here; but no notice was taken of the fact that there are just as many plants suitable for rock-garden work which thrive better in our American climate than they do in England!

Many native American plants have been found suitable for rock gardening, and there are hundreds of others not yet procurable through ordinary commercial channels, many of which are gradually becoming available. Now that we have broken

away from the continental apron strings in rock gardening and have really started out for ourselves, even though we have not yet progressed far along the road, rock gardening may be satisfactorily undertaken in practically all sections of this country, even though the same plants may not be utilized everywhere. As our experience increases, we are finding out what can and what cannot be grown under our widely differing climatic conditions.

In this connection it may be pointed out that the true alpine plants are native to sections where the growing season is extremely short, usually not over a hundred to a hundred and fifty days. They are to be found in all parts of the world between the timber-line and the snow-line, or so far toward the north or the south pole that the climate is similar to that of high mountain elevations. Quite naturally, such plants as these do not feel at home where they are subjected to weeks if not months of hot, dry summer weather. Fortunately, however, plants for the rock garden are not restricted to the alpines.

SOIL

If there is one thing more than all others which the great majority of rock plants, including not only the true alpines but the many additional varieties suitable for rock work, insist upon having, it is *extra good drainage*.

If the rock garden is artificially built, and elevated, as it usually is, above the general ground level, good drainage will be assured provided a suitable soil has been used.

For the natural rock garden, to be planted where nature has built the framework of the garden, this should be the first consideration. Often rocks are to be found in abundance where drainage is poor; such a spot, no matter how picturesque it may be, will not make a good site for the rock garden. Under such conditions, good drainage may be provided artificially, but usually only at considerable expense.

As to the soil itself, most alpines and rock plants shun a clay soil; nor do they prefer an extremely sandy soil. The soils to which they are native are composed mostly of decom-

posed rocks and shale in which the majority of our ordinary garden plants would fare but ill. Some of them insist upon having this type of soil when grown under domesticated conditions, while others are more adaptable. In Chapter VII, this subject is taken up in further detail.

As is the case with some of our other garden plants, some of the rock plants prefer a lime soil and others an acid-reacting soil, while still others appear to be entirely indifferent. In the lists given in Chapter XII, some of the lime lovers and some of the lime despisers are mentioned.

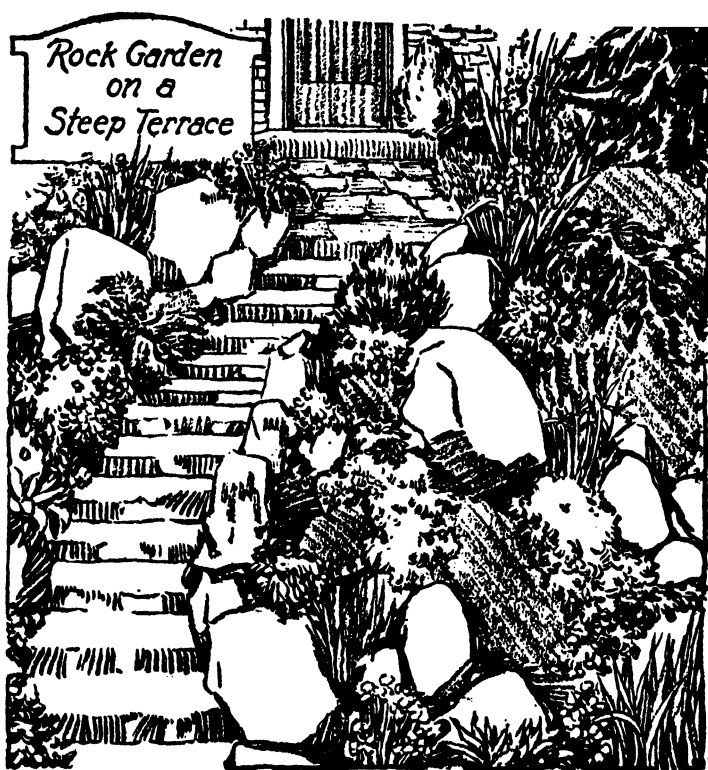
Unless the rock garden is to be constructed on a very generous scale, the matter of soil, while important, is not a serious consideration, for the comparatively small amount required may readily be made to order by the amateur rock gardener. Directions for this work are also given in Chapter VII.

LOCATION

Some of the rock plants like the full, blazing sun, others semi-shade, and still others do best in full shade. Still another group require full light, but a northern exposure only.

As it is not convenient to have the rock garden in several sections, located in several parts of the grounds, where these various conditions might be provided, the location selected for the rock garden should, if possible, be such that everything from full shade to full sunlight may be obtained. This may, to some extent, be provided for in the construction of the rock garden itself; but where existing trees, a northern slope, shade of a building, or similar existing conditions can be taken advantage of, they should be considered in selecting the site for the rock garden.

Other aspects of the location of the garden, such as its appearance in connection with the rest of the landscape planting, the desirability of having it in a secluded and protected spot, have already been discussed. The deeper and more constant the blanket of snow which may be kept over the rock garden through the winter months, the better. Not infrequently it is possible to construct it at the bottom of a ledge or bank, or upon



a slope where the snows naturally drift deep and stay long. Where, by any chance, such a location is available, it should be taken advantage of, especially for the growing of the alpine varieties.

CARE

There has been something of a tendency of late to emphasize the impression that the rock garden, once planted, may be left to take care of itself. This has been used as an argument for the making of this type of garden. There is danger of misleading the beginner in this direction.

To begin with, a rock garden is, perhaps, the most difficult of any kind of a garden to weed—and some weeding is bound to be required. It is true that no manure need, or should, be used in the soil of a rock garden, and this source of weed troubles is eliminated. But no matter how careful one may be with the preparation of the soil, some weeds will appear; and from its very character, the rock garden makes an excellent harboring place for weed seeds from other sources. Some of the rock plants themselves seed freely, and must be kept in check to keep them from taking possession of the whole area; others will spread much more rapidly than some of their neighbors, and these must be curtailed by cutting back and by an occasional replanting to keep them from occupying much more than their allotted space. Plants may not do well where they are first set out, and may have to be shifted several times before we find the exact spot where they seem to be happiest. This may be fascinating work, but it is work, nevertheless, and requires time.

It is true that a rock garden may be so planned and planted that it will require very little attention. But to any one thinking of putting in a rock garden with the idea of eliminating the care which most gardens require, I would suggest instead a planting of hardy shrubs or of some of the ranker-growing perennials. An uncared for and unkempt rock garden is not picturesque; it is about as slovenly and unlovely looking an object as can well be imagined.

CHAPTER IV

THE SETTING FOR THE ROCK GARDEN

IF the rock garden is regarded as a feature of the general landscape scheme, and not merely as a spot in which rock plants may be grown, then its background or setting becomes almost as important as the foundation planting is to the house.

Too often, the rock garden is not fitted into the general planting scheme. It is left an independent and isolated spot, set apart by itself, and as a result sticking out with a prominence as undesirable as it is unnecessary. It is, at best, sufficiently difficult to give a hand-made rock garden a passably natural appearance, without accentuating its artificiality by thrusting it out by itself, where it will look no more in keeping with its surroundings than a rowboat full of geraniums and coleus imbedded in the front lawn.

FRAMING THE ROCK-GARDEN PICTURE

Even the artificial rock garden, as we have already seen, must be given some semblance of naturalness if it is to be attractive as a garden, and not be merely an interesting collection of out-of-the-ordinary plants.

Nothing will help quite so much to give this atmosphere of naturalness as an appropriate setting or background of trees and shrubs. If suitable varieties are selected and they are arranged with good taste, they will serve both to frame the rock-garden picture, and to blend it naturally into the landscape planting.

In Japan, where the landscape possibilities of the rock garden have been developed much more than anywhere else, the background or setting for the rock garden is always carefully worked out. There is a natural, almost imperceptible gradation of form and size, so cleverly executed that one does not readily perceive where the rock garden ends and the rest of the landscape begins. We are apt to think of Japan as a land of miniature gardens. It is not. Japan's forests and full-size landscapes are as fine, and on as large a scale, as those to be found anywhere. But the consummate skill with which sharp lines of demarkation have been eliminated seems to make the whole country appear to be one huge garden. As a result, both public and private gardens, with their carefully placed stones and dwarf trees, seem to stretch away without interruption to the forests on the mountainsides.

Of course, we cannot all be such masters of composition, of proportion, and of perspective, as are the Japanese. The most untutored beginner, starting with the simplest of rock gardens, can, however, provide a planting which will somewhat break and make more gradual the transition from the rock garden to tall trees or perennial borders, or a sweep of smooth lawn.

The plants used for this purpose should be suitably taller than those used in the rock garden itself, and yet of a character, in foliage and in general habit of growth, which will be in keeping with the naturalistic or Japanesque effect of the rock garden. These, in turn, may be backed by still taller sorts, especially by evergreens.

The setting for the rock garden may be arranged back of it, in a curve, covering the rear and flanking the sides, or planted almost completely around it, as circumstances seem to make desirable. One of the most attractive rock gardens I know is entirely surrounded by coniferous evergreens, with an inside planting of broad-leaved evergreens, which hide it entirely from view until one enters it from a curved narrow path at one end, when its full beauty bursts suddenly and un-

expectedly upon the visitor. There are suitable recesses, with inviting seats, where one may rest either in sun or shade.

SELECTING THE SITE

While we have already spoken of several of the points to consider in selecting the site for the rock garden, the subject is mentioned again here, in relation to the setting or background for the rock garden.

Where there are growing trees, particularly evergreens, which may be utilized in making a setting suitable for the rock garden, they should be used if possible. Often it is better to sacrifice some other advantage of location to this end, even if additional work in construction is involved. It takes many years to grow evergreens, or even deciduous trees, of good size. And nothing will help more to remove the undesirable tone of brand-newness from the new rock garden than a few well-established trees in close proximity to it. One word of caution, however: Do not build too near large trees, especially such thirsty feeders as maples, which may rob the all-important moisture from your rock plants.

Most of these remarks apply to any other natural feature, as well as to trees, which would fit into the setting of the rock garden in a way to add to the general impression of naturalness.

It is well to provide for a considerable amount of shade for at least a small section of the garden. In regions where the snow is not likely to remain through the winter months, a low planting, which will protect at least that part of it to be devoted to alpine plants from the winter and very early spring sun, is desirable. Where there are likely to be hot, drying winds during spring and early summer, these may be to some extent guarded against. Protection from cold winter winds, which most of our garden plants are thankful for, is not at all necessary for rock plants and alpine, as they will stand any amount of this sort of exposure. Alternate freezing and thawing, muddy soil about their crowns or leaves, too much exposure to sunshine while they are dormant, and, above all, wet soil re-

sulting from poor drainage—these are the things they require protection against.

The setting for the rock garden may be planted in advance of the construction of the rock garden itself, but ordinarily it is more satisfactory to put this in afterward, with the possible exception of a few of the “key” or most important plants, such as some of the larger evergreens or shrubs. If the entire background is put in in advance, it is likely to be in the way, and possibly injured, during the building of the rock garden.

CHAPTER V

CONSTRUCTING THE ROCK GARDEN

HAVING determined in a general way the type of rock garden to be attempted, and selected the spot which, everything considered, seems to be the most suitable for its location, we come to the actual construction of the garden.

It is here that a rock garden differs from all others; and here also that it is imperative to make haste slowly. For a rock garden, once established, cannot be changed or even altered without practically undoing everything which has been done. It is an easy matter to shift your perennials when their arrangement does not fully satisfy you. Plantings of shrubs may be changed; even individual evergreens may be moved without much trouble. But the time to make alterations in your rock garden is *while you are building it*.

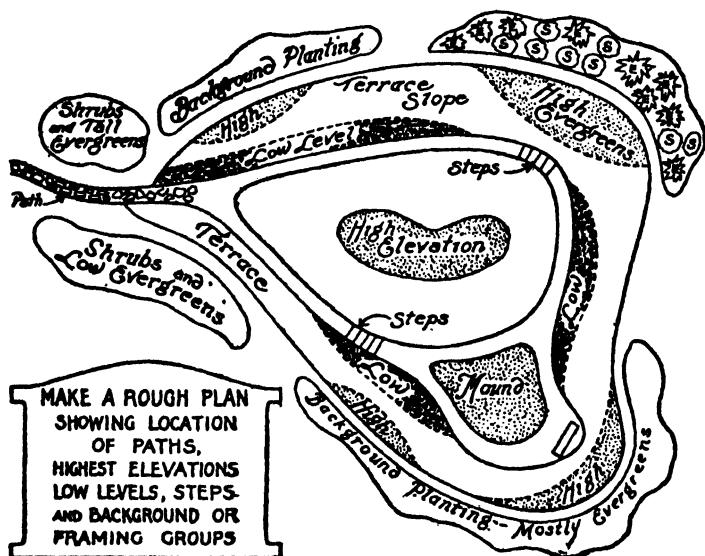
MAKING THE PLAN

In making a hardy border, a rose garden, or a bulb garden, it is simple and practical to draw up a fairly definite plan of the planting scheme in advance. Dimensions and even the location of individual varieties may easily be indicated. Any intelligent gardener can take such a plan and from it construct the garden, just as it is wanted.

In making a rock garden no such definite procedure is possible. It must be shaped and molded as the work progresses. If you want it to be *your* rock garden, you must personally supervise the work—better still, do much of it with your own hands. The alternative is to hand the job over to some one who is familiar with rock-garden building and leave the execu-

tion to him. But at your peril entrust it to any one who is unfamiliar with this kind of work!

The Ground Plan. It is, however, both feasible and desirable to make a ground plan of the projected rock garden, showing over-all dimensions, the location of paths, and possibly of the sections to be devoted to different classes of rock



plants; and indicating also the extent and position of the background planting or setting.

It takes but little time to make such a plan, and you will find that it helps greatly in giving definite form to that mental picture of your proposed rock garden which you should have before actually beginning the construction. Such a plan for a fairly large garden is shown on this page.

Paths. Unless the area to be occupied by the rock garden is very small, a path or paths leading through it will be desirable. These should be in the form of natural but very irregular curves. Any sort of symmetrical design will immediately de-

stroy the whole spirit of the rock garden. If the paths can be so arranged that at some points elevations of rock and soil rise abruptly from them, while at other points the rock garden is level, or nearly so, for a little space back from the sides of the path before beginning to rise, the natural effect of the whole will be heightened because of the additional contours. The height to which these elevations should be carried will depend both upon the size of the rock garden and the natural surroundings. Where the garden is to be constructed upon a level piece of land, it is better to keep the elevations comparatively low—avoid anything in the nature of a pile of soil and stones. At those points where the edge of the rock garden is to be flanked by evergreens, the elevation may be carried to a considerable height and somewhat flattened at the top, and terminated. The evergreens directly back of them will keep such elevations from looking out of proportion, and suggest a small ravine or hollow beyond.

Study Nature Before You Build. Some writers suggest that the rock-garden builder select some existing range of hills as a model. This has always seemed to me both foolish and impractical. Unless the work is attempted on a huge scale, the result of any such imitation is bound to look out of place. The rock gardener can take worth-while pointers from nature, however, in the study of rock arrangements under natural conditions. Such observation is bound to reveal at least five things: (1) Absolute lack of regularity or uniformity in the placement of the stones; (2) the suggestion, which in this case is also a fact, that only a small part of the rock appears aboveground; (3) the impression of everlasting permanence and unshakable stability; (4) absence of any effect of crowding—there is space enough for each and for all; (5) uniformity in the texture of the rocks, and also in the way they lie, usually with the grain or stratification horizontal.

Any one who will remember these five points, while he is building, will avoid the commonest mistakes in rock-garden construction.

The Rock-Garden Model. The beginner who would like

to visualize his rock garden before beginning construction, may construct a model, showing the general form and contours of the garden. Even if it is not worked out in much detail, it will serve the purpose. The expense is inconsequential, and the work will afford a few evenings' amusement and may save some mistakes and time in the building, so it is worth trying. A piece of thin board, approximately the proportions of the garden site, is used for the base, upon which is molded either modeling clay or plasticine. I have found the latter preferable to clay. Pebbles of various sizes, or bits of rock chips, may be used as stones. Evergreen twigs may represent the larger plants and the background planting. It is much easier to manipulate plasticene and pebbles than it is to handle soil and rocks, some of which may weigh hundreds of pounds.

MATERIALS FOR ROCK-GARDEN BUILDING

Often the stones of which the rock garden is to be constructed may be obtained locally; sometimes on the place itself. Under these conditions, we must usually take what is available, and make the best of it. But not all stones are equally good for rock-garden building.

"Sympathetic" Stones. If rock plants ask for bread and you give them a stone, they will be very well satisfied—if it is the right kind of stone. Some rocks, due to their character and texture, are termed "sympathetic" to plant life. This depends, primarily, upon their porosity—the capacity for absorbing and storing moisture, and thus encouraging the creeping, thirsty roots to hug the rock and follow its surface deep down into the soil. If you have roamed through fields and woods, or have stones about your own place, you have undoubtedly observed the difference among them in this respect. Some stones have a smooth, close-grained surface as impenetrable as marble; others are so porous that they will almost drink water like blotting paper. I have used sandstone of such texture that the plant roots actually grew into the surface. Neither extremely hard nor extremely soft stones are best for rock-garden making; the former are not "sympathetic" to plant growth, and

the latter are not practical because they so quickly disintegrate and crumble, often going to pieces in a single season when exposed to rains and frost action, although they may seem fairly substantial when put in place.

Types of Stone to Use. Hard, close-grained stones like granite are often used because they are easiest to get. If the pieces are irregular and with rough surfaces, as mined from the quarry, they will serve the purpose. Field stones or boulders, frequently found in places where there are glacial deposits, ground to smoothly rounded surfaces, are the least desirable. Limestone, or sandstone which shows a distinct grain or stratification, and obtainable in irregular blocks of varying sizes and shapes, are the most desirable. Field rocks, if not too small, are also excellent, particularly if they have weather-beaten, or moss- or lichen-covered surfaces.

Even in a small rock garden, it is well to have at least a few "old he-ones"—rocks which take a great deal of pushing and possibly some strong language to get into place; but which, once you get them where you want them, will give character to the entire planting. They possess beauty and individuality no less than the plants with which they are to be associated. Japanese gardening is almost literally rock landscaping. In many of the wonderful compositions in Japanese gardening it is the plants, rather than the rocks, which are subordinated.

Tufa Stone. This material, which is a volcanic rock, is extremely ornamental both in form and texture, extraordinarily porous, light, easy to arrange, and in many ways desirable. Its cost, determined largely by freight charges, is not prohibitive for use in a small rock garden, especially where a picturesque or Japanesque effect is desired. It does *not* fit so well into a natural rock garden. This material is handled by many concerns which specialize in rock plants.

Other Materials. Rough slate, which is suitable for many garden uses, is best omitted from the rock garden, unless possibly for the making of paths, steps, stone seats, or similar features where there is no reason for not using a type of stone different from that employed for building the garden itself.

Old weathered logs of wood are sometimes employed in the construction of steps, or to hold an embankment in place. One serious objection to wood is that it decays quickly; but in appearance, if chosen with good taste, it is satisfactory.

DETAILS OF CONSTRUCTION

The first step in the actual construction of the garden is to lay it out, at least in enough detail to show its general contour, to indicate paths and so on. These points had best be marked by fairly stout stakes driven into the ground, as otherwise they are likely to be obliterated. Where there are no ledges or stones to start with, some excavating will be necessary. This is not alone for drainage. If the rock garden is merely constructed on the surface of the soil, there will be a break at this point which seriously interferes with the moisture supply. The base or foundation of the rock-garden structure should be literally *buried in the ground*. The foundation should consist largely of stone. Small, broken pieces, flat stones, soft stone or shale, rock débris of any kind not suitable for use above ground may be utilized here to advantage for "filling in." Old bricks or masonry rubbish will answer; cinders (not soft ashes) serve admirably. And the bases of the largest rocks, the tops of which will appear aboveground, should be sunk well below the soil level. Incidentally, the excavation made gives soil to use aboveground.

Under ordinary conditions, where the subsoil drainage is good, twelve or fifteen inches will be deep enough for this preliminary excavation; often less on a slope or a bank. If the subsoil is hard, it should be thoroughly broken up with a pick. Many writers recommend an excavation of three or four feet. It is much easier to *recommend* than to execute—one is more likely to feel like executing the recommender. Such a depth is necessary only where drainage is abnormally poor.

With the excavation completed, the "skeleton" of the rock work may be laid out—the larger stones put in position, and a sufficient number of others placed at important points where the construction is to follow. Also the steps, if there are any, may be put in.

The construction of the rock garden may proceed along any of several different lines, according to the type which is to be built and the local conditions. These may be classified as follows:

The Mound Rock Garden. Where one has to start "on the level" and with no stones naturally in place, the simplest method of construction is in the form of a continuous mound or ridge. This may be "faced" in both directions, or in only one. (See accompanying cut.) A row of the larger stones may be



Mound Placement of Larger Stones

put in place first along the edge or edges. They should not, of course, be laid in a straight line, nor should they touch, and the spacing should be uneven. Then fill in a layer of stone and soil back of them, and proceed to build on up. The surface stones should be laid as indicated in the accompanying diagram—flat and pointing *downward*, both for stability and to catch and drain into the soil as much as possible of all rains or condensing moisture which may be caught by their projecting edges. Constant watching will be required to get the most attractive side or face of each stone turned outward. Almost invariably, too, each stone should be placed with its natural base down. The soil used in building should have been prepared in advance. (See suggestions in Chapter VII.) Where the plants are to be set in pockets, or in crevices between the stones, the soil should be kept as loose as practicable. Nevertheless, each stone should be made absolutely firm in its place.

The Sunken or Semi-underground Rock Garden. Fre-

quently the garden is not built entirely upon the surface, but formed by excavating a considerable portion of the area to be used, throwing up the soil removed around the edges, or piling it up along one side. This arrangement naturally involves more work, but it has several advantages.

In the first place, it makes possible a greater range of conditions under which the plants may be grown. If one is anxious to have as wide a selection of rock and alpine plants as possible, this is important.

But this excavation should not be in the nature of a hole in



which water may collect. It may be started at the ground level with possibly one or two steps down, and it should gradually grow deeper as it proceeds. If made on level ground, the path will have to slope gradually downward, but if it is built into a rise of ground, the path may be kept nearly level. As a large amount of soil must be removed, which can be piled up around the outside, the height of the sloping sides which are to be planted is considerably augmented. A depth of four or five feet below the natural ground level provides space for planting six to eight feet high. Sometimes there is an old cellar hole, a natural hollow, or other depression which may be used in this way. Even a small excavation, not more than two or three feet deep, opening off from one side of the ordinarily built-on-the-surface rock garden, will provide not only an agreeable

variation in the general plan but conditions of shade and protection for various types of plants.

A Natural Rock Ledge, which often constitutes the most beautiful of all settings for the rock garden, will, of course, require entirely different treatment. Fortunate, indeed, is the gardener who thus has nature as a partner in his enterprise—and yet how often the property owner pays hundreds, sometimes thousands, of dollars to obliterate every vestige of stone, and attempts to make a lawn or a flower garden which will never do well in the unsuitable location afforded it.

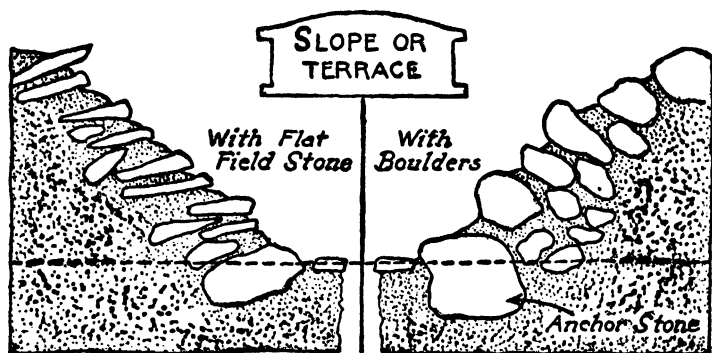
Not often, however, does nature turn over a rock garden ready to plant—the partnership is not so one-sided as that! If she provides the rocks, it is usually up to the gardener to provide the soil. Such as is already in place may be dug out or scraped out sufficiently to provide “pockets” for new soil in some spots, and good-sized holes in others. Many rock plants or alpine will thrive with the merest “toeholds,” a crack or crevice through which their long, strong roots will reach down to moisture and food. These may be provided at various points by the use of iron wedges, a stout crowbar, or an earth auger, the prepared soil being crammed down into the openings made.

Cement may sometimes be used to advantage in making additional pockets, especially where the stone surfaces are large. This should be employed in such a way as to be as inconspicuous as possible, by mixing with the mortar pieces of the native stone. By drilling, and inserting pieces of scrap iron for support, pockets large enough to accommodate many suitable rock plants may easily be made even against a flat rock surface. At the point of juncture the stones should be washed clean, and if very smooth, chipped or roughened to allow the cement to make a good bond. The plant growth will soon cover these pockets.

The creeping and trailing rock or alpine plants and small or prostrate shrubs or evergreens, can generally be used to especially good advantage in natural rock gardens with large stone surfaces.

The Terrace Rock Garden. Where a steep slope or terrace is present to begin with, an effective and beautiful rock garden may usually be made more easily than under any other condi-

tions. The chief difficulty here is to avoid a stilted and artificial-looking job. Be sure to bury the stones deep enough so they will not look merely "stuck on" the surface. And by all means do *not* allow a smooth, even grade, such as would be desirable if the bank were to be sodded; your gardener or workmen will be sure to finish with just such a grade if you do not prevent them. Care must be exercised, also, to use stones sufficiently varied in size and shape. The filling between the

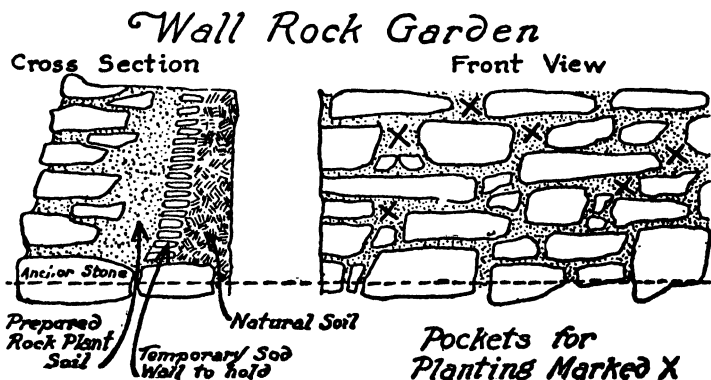


stones, especially the four or six inches at the surface, should be prepared soil.

The Wall Garden. This type of rock garden is perhaps the most generally overlooked of all opportunities for utilizing rock plants. At trifling expense, many an unattractive if not positively ugly wall may be converted into an object of astonishing beauty, with literally breath-taking masses of color for many months of the year.

Where a wall is to be used for the growing of plants, it is far better to construct it with this object in view than to attempt the adaptation of an old wall. The soil behind the latter is almost sure to be unsuitable, and also to be too hopelessly dry even for rock plants. However, much may often be done in the way of planting along the top of an old wall, using varieties which will trail over or form hanging mats; and a few pockets may be inserted in the upper part of a wall, where it is possible to get some moisture into the soil back of it.

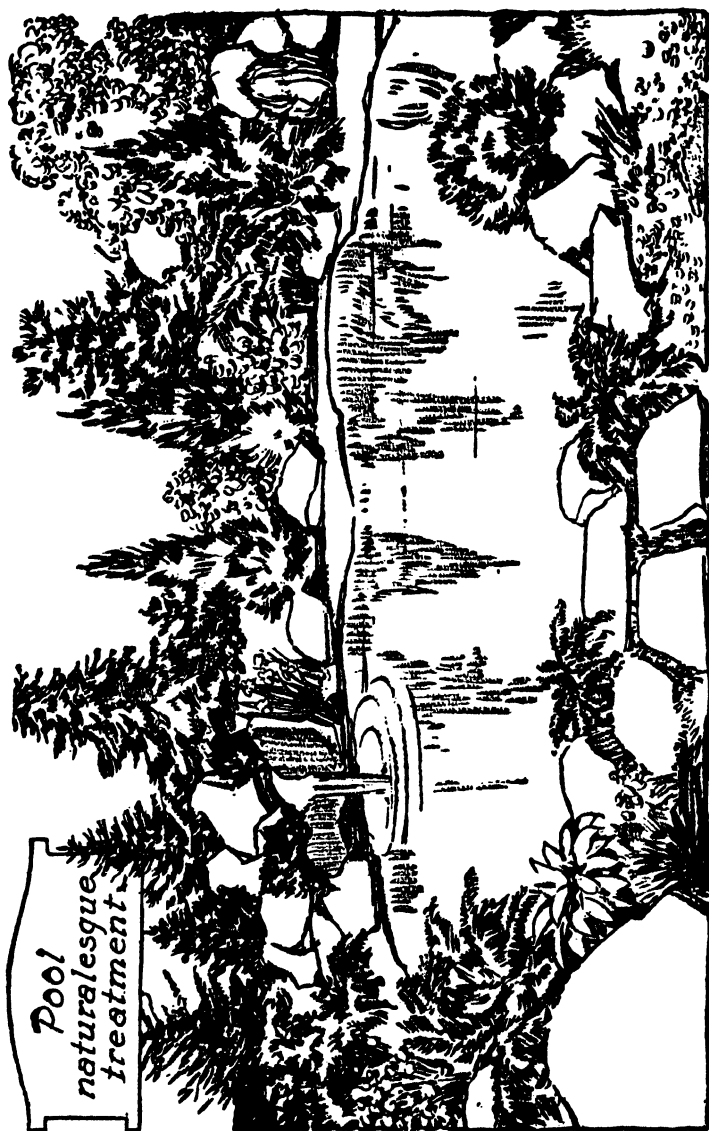
When the wall is laid with the idea of planting in mind, it is best to keep it rough and uneven, giving it something of the character of the rock garden. Also have it slope backward toward the top, so that rain or artificial watering will have a chance to reach and soak into all the crevices or pockets. The stones should slant downward into the soil back of them, which, to a depth of at least a few inches, is best prepared for the pur-



pose. (See page 43.) Provision for the plants should be made as the stones are laid. The accompanying sketches show both cross section and front view of such a wall and illustrate the details of construction.

Often it is possible to build a wall, especially for planting, in front of an old retaining wall of solid concrete or masonry. An average of four to eight inches between the retaining wall and rock-garden wall to be erected in front of it will provide ample sustenance for the plants. Usually, solid retaining walls are provided with drains to allow for the escape of surplus water from the soil behind them; these help to supply moisture to the soil provided for the plant roots.

The planting of a wall garden should not be overdone. Do not use too many varieties; plant these in groups of several in a place, and leave irregular, large sections of the wall surface exposed, thus providing a natural-looking setting for the plants. An overplanted wall defeats its own purpose.



CHAPTER VI

WATER FEATURES

WATER, in one form or another, may frequently be introduced into the rock garden, adding greatly to its charm.

I would like to point out at the beginning, however, the distinction between bringing water into the rock garden and bringing a water garden into the rock garden—a difference which, despite its importance, is seldom realized.

The water garden is a distinct type of garden just as is the rock garden. A pool of nympheas and other aquatics within a rock garden is incongruous, to say the least; it spoils any effect of naturalness. Where there is plenty of space available, the rock garden and the water garden may be associated; *but they should never be actually combined.*

To present the subject from another angle, water in the rock garden should be employed merely as an additional medium which will help give variety and charm to the miniature landscape which we create. Again we may profitably go to nature as our instructor. Many things such as ferns, small bog plants, and moisture-loving rock plants and alpines can be used near the water, and will be entirely in keeping with the rest of the picture.

Keep in mind that the smaller the garden the more difficult it is to employ water and achieve results which look natural. With a small rock garden it is better to omit the water altogether than to spoil what might otherwise be a passably natural effect by dragging in a palpably artificial pool or waterfall.

TYPES OF WATER FEATURES

In considering the addition of water to the rock garden it is essential to decide in advance just what is to be attempted.

Whatever is done should be incorporated in the construction of the rock garden and not added as an afterthought.

The Pool. The pool is the simplest, the safest, and usually the most satisfactory form in which to introduce water. This is particularly true with rock gardens of small size. It is not difficult to construct a pool which will look natural. Even though it be shallow, it will serve as a mirror to reflect bits of color and catch the ever-changing cloudscapes of the sky. Needless to say, it should be irregular in shape, and bordered with rocks so placed that they will look as though they had "grown" there. With the development of plant life, the effect of naturalness will increase. The pool, if carefully handled, may occupy a considerable part of the total area of the rock garden.

A Stream. A stream is best not attempted where the operation is small. In the natural rock garden of considerable area, especially if there are different elevations, it may be introduced with charming results. If a series of small pools are constructed at different levels, with a winding rivulet connecting them, no great flow of water will be required. It may be made to appear very much longer than it is if hidden here and there by a skillfully arranged bit of planting. Where it is concealed from view, it will have the effect of leisurely meandering about, and then coming back into sight again.

Waterfalls. A waterfall, even though it may be very small, will add the charm of both motion and sound to the garden picture. A mere trickle of water falling from a slight elevation into a pool below will accomplish this, if one provides the means of making the tiny stream actually fall through the air, instead of running down over the stones. The trick necessary to produce this result is shown in one of the accompanying illustrations. The water is conducted to a point or points, whence it must really drop off, by affixing to the ledge of stone over which it flows bits of rough concrete a few inches long, and cone shaped; these will usually become covered in due time with moss or water plants.

The Moraine. The moraine is mentioned here because it is referred to in most rock-garden literature, particularly in that



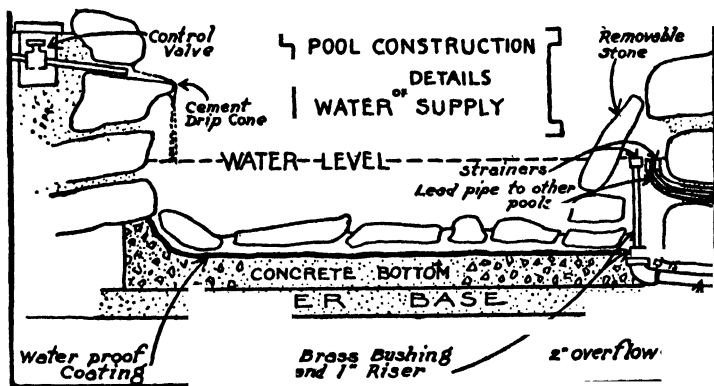
from the "other side," and occasionally in catalogs. A moraine is a sort of cross between a rock garden and a bog garden. It is exceptionally well drained and dry on the surface, but with water available beneath. There are a few plants which require this combination of conditions to do their best. The majority, however, can be grown satisfactorily without creating this special form of rock-water garden for them. The beginner, therefore, need not include the moraine among the things he has to worry about in getting a start with rock gardening.

The Bog Garden. The bog garden is not properly a part of rock gardening, but there are many small bog plants which may be grown in connection with a rock garden if given moist soil. (See list in Chapter XII.) These should be placed near the pool or stream if there is one.

MECHANICAL DETAILS OF WATER FEATURES

The handling of water in connection with rock gardens is not nearly so difficult as the beginner is likely to suppose. A one-inch pipe connected with the house-supply system will amply supply the requirements of a small garden. It is well to have this, anyway, for reasons given later in this chapter.

The pipe should be given an even slope, either to or from the garden, so that it can be drained out during the winter



months. For this purpose there should be a valve where it takes off from the main water system. Another at or near the garden will be convenient in regulating the flow while it is in use.

Within the garden itself it will be best to use lead pipe, as this may readily be bent in any shape or direction required. The accompanying illustration shows the method of bringing the water into the garden and of handling the overflow from it.

WATERING THE ROCK GARDEN

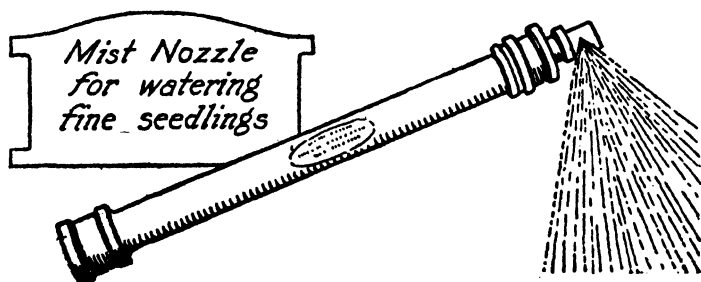
This is a matter of the utmost importance, which nevertheless is scarcely mentioned in rock-garden literature. In England, of course, this is not so vital a matter as with us. With less sun, more rain, and more moisture in the air, rock-garden plants, especially alpines, are as apt to suffer from excessive moisture there as they are from lack of it here.

I know of no other one thing which will contribute more to success with rock plants—yes, and even with alpines—under American conditions, than an adequate water supply and the proper means of applying it to the rock garden. This will sound like heresy to some authorities. Nevertheless I feel very positive on this point.

When speaking of the proper means of applying water, however, I do not refer to either the watering can or a hose with the usual garden nozzle. The former takes too much time, and the latter, with any nozzle I have ever used, applies water so rapidly that it will begin to run on the surface before the soil is saturated clear through. But it is a simple matter to provide a mistlike spray which will saturate the driest soil through and through without spattering mud on the smallest leaves or the most delicate blossoms, or causing the soil to run out from the most precarious rock crevices. There is a special type of greenhouse irrigation nozzle which applies the water in this fine mistlike spray. If this type of nozzle is substituted for the ordinary nozzles in a portable irrigating outfit, the rock garden can be watered with the utmost thoroughness and safety whenever necessary. Such a watering will last two or three times as

long as one given with the ordinary watering can or hose nozzle. One of the irrigation concerns also manufactures a short brass tube fitted with a hose coupling at one end and one of these mist-throwing nozzles at the other—a device copied from a home-made affair which I hit upon some years ago in endeavoring to find a suitable method for watering tuberous begonia seeds, which are like fine pepper. I always use one of these nozzles for watering all fine seedlings or delicate plants. The hose, equipped with this nozzle attachment, may be supported in one position and left for a long time without any danger of overwatering.

For a large rock garden, however, a portable irrigating outfit of the nozzle-line type, with greenhouse nozzles in place of the ordinary garden or lawn nozzles, will be found the watering system par excellence. It is supported on metal rods which may be pushed down anywhere along the garden path or between stones without disturbing the growing plants, and it may be set up or taken down in a few moments.



CHAPTER VII

SOILS AND FERTILIZERS FOR ROCK PLANTS

THERE is probably no question connected with rock gardening which is more of a bugaboo to the beginner than that of providing suitable soil, or soils, for the little friends whom he has invited into his garden and intends to do his best to make happy. To read some of the works on this subject, the layman may easily get the impression that it is really necessary to provide each individual plant with a soil made up according to a special prescription! Nowhere in the whole broad field of gardening is "debunking" required more than here.

WHAT THE ROCK GARDEN SOIL SHOULD PROVIDE

The secret of success with rock plants, so far as soil is concerned, is the old, old one of going back to nature and of taking a look at what she herself provides them with.

Drainage. If you climb up a rocky mountain slope to the timber-line, to the bleak and native haunt of the alpine, or search out most of the other rock plants and find where they grow as wildlings, the most apparent characteristic of the soils in which they grow is plainly to be discerned—it is exceptionally excellent drainage. Drainage not of the subsoil—as we usually speak of it in connection with flower garden, orchard, or field—but quick and complete drainage of *the surface*. Often the clumps of leaves of the little plant, hugging the ground closely as they must to preserve an existence, rest directly upon shale, gravel, or splinters of rocks. And so our first consideration in supplying a man-made soil for this class of plants should be porosity, assuring not only good drainage

as we ordinarily use the term, but the immediate escape of all surplus water to the lower soil levels.

Moisture. If, however, you attempt to pull up one of these tiny, and possibly rather frail-looking, denizens of the plant world, you get a sharp surprise. It is simply anchored fast, and will require much more effort to dislodge it than would many plants in your garden ten times its size. In fact, if you could succeed in getting it out, roots and all—which would be extremely difficult—the most conspicuous thing about it would be the extreme length of the roots in proportion to the top. And if you could follow to where the roots penetrate, you would discover an unsuspected degree of moisture in the stone-filled soil; for stones, in spite of their dry appearance, are among the most efficacious of moisture conservers.

And so, in addition to exceptional drainage, we must add to our analysis an abundant moisture supply.

Plant Food. If we inquire still further into the life secrets of these little plants, and attempt to seek out their food sources of sustenance, we immediately strike a rock, both figuratively and literally. Most of our common garden plants would starve to death in the soil in which they thrive. And, vice versa, many of these little plants cannot long survive a diet of manure and fertilizers on which our garden plants grow lustily—although some of them, it must be confessed, will take to the change like ducks to water.

And so it is apparent that a large supply of plant food, as we prepare it for our long domesticated garden flowers and shrubs, is one of the things that is *not* essential for the class of plants under consideration.

So, having analyzed the soil conditions which nature provides, let us see what we can do toward synthesizing, or putting together, a manufactured soil which will come somewhere near duplicating it.

A GENERAL PURPOSE ROCK-GARDEN SOIL

The gardener knows that there is nothing like coarse, gritty sand for increasing the drainage properties of a soil. He uses

it in his cutting bed, in the soil he mixes for potting. So sand will be one of the ingredients.

The roots of rock-garden plants, as we have seen, like to cling around the moist surfaces of bits of stone buried in the soil, while the leaves rest upon those pieces which work their way to the surface, thus avoiding direct contact with the dirt. So another ingredient will be stone chips. Ordinary crushed stone, such as is used for surfacing roads, is suitable; this can be readily procured in most sections. If not, bank gravel, preferably not too fine or smooth, and not "washed," will serve as a substitute.

For our third ingredient, we add humus or decayed vegetable matter, which is found almost invariably in soils in which rock plants grow. This material holds an additional supply of moisture, besides furnishing some plant food. For supplying humus, I like granulated peatmoss. It is so slightly acid that only the extreme lime-loving plants object to it, and it absorbs and holds more moisture than any similar material. Moreover, it is both pure and absolutely free from weed seeds, an advantage which cannot be overemphasized in rock-garden planting. Peatmoss is now readily obtainable anywhere; but if you do not happen to have it, finely sifted leafmold will serve. Commercial humus has more of a tendency than either of the above to get wet or soggy.

Fourthly, and lastly, to give additional body to the plant food, we add good light garden loam. This, however, should be wholly free from clay, which is the last thing, in the way of soils, to be used where rock plants are to go.

All this has required some time in the telling, but if you boil it down it comes to this. To make a satisfactory all-round rock-garden soil, mix thoroughly together the following:

- 1 part clean, gritty sand,
- 1 part stone chips, or clean, gritty gravel,
- 1 part granulated peatmoss, or sifted leafmold,
- 1 part clean, light garden loam.

And there you have a soil in which ninety per cent of the

rock plants you are likely to try at the start will grow satisfactorily!

SPECIAL SOILS FOR SPECIAL PURPOSES

Occasionally, however, you will find plants that require something different from the above in the matter of soil; these will grow in the above mixture, but will grow better if their tastes are catered to. Some insist upon having an extremely acid soil, or a lime soil, in order to survive at all.

Such plants as these may either be grouped by themselves, as already suggested (see page 16), or may be started in pockets filled with a soil supplying their own special dietary requirements.

These special soil mixtures may be made up according to the following prescriptions, the chief changes being an increase in one part or another of the several ingredients. These proportions are approximate; there is no necessity for weighing out the ingredients on a jeweler's scale.

Acid Soil.

1 part sand,
1 part stone chips,
3 parts acid leafmold
(that is, leafmold gathered from under evergreens, laurels, or the like).

Dry Soil.

3 parts sand,
2 parts stone chips,
1 part loam,
1 part peatmoss.

Moist Soil.

1 part sand,
1 part chips,
1 part loam,
3 parts sphagnum moss,
or granulated peatmoss, or both.

Lime (or Sweet) Soil.

1 part sand,
2 or 3 parts old plaster,
1 part loam,
1 part peatmoss.

FERTILIZERS

For plants other than the true rock plants and alpine—such as garden perennials and annuals, shrubs, evergreens, and most bulbs—and also for such of the rock plants or alpine as take readily to a somewhat stronger diet, very often decayed manure and bone meal may well be added to the general soil mixtures suggested above. For evergreens, shrubs, or

other plants which are to be set around the rock garden, by way of a background or setting, such conditions as are usually provided for them should, of course, be given.

Do not use any of the commercial fertilizers, except bone meal, and even with this great caution should be exercised.

Lime is not a fertilizer, but may occasionally be needed for the rock garden. If old lime rubbish, which is better for this purpose, is not to be had, ground limestone or gypsum may be used, to modify a soil otherwise too acid.

Aluminum sulphate, now offered by most seed houses, works in the opposite direction. This may be utilized either to neutralize a lime soil, or, by applying it in larger quantities, to make the soil acid-reacting. I prefer, however, acid leafmold, which is to be found in most sections if one will take a little trouble to hunt for it. Leafmold gathered under oak trees is sufficiently acid for most purposes, if decayed laurel leaves, conifer needles, or rhododendron leaves are not to be had.

TOP DRESSING FOR ROCK GARDEN PLANTS

Where plants gradually work themselves out of the soil, or are lifted out by frosts, or have their roots laid bare by heavy rains, they may be cared for by the application of a top dressing made of

1 part sand,

1 part loam,

2 parts granulated peatmoss or leafmold.

This mixture should be run through a sieve so as to be light and fine and easily applied wherever it is needed. Excelsior also makes an excellent winter mulch for such plants, especially the first season after planting. It greatly modifies the direct action of sun and frost upon the soil surface, which sometimes causes young plants to "heave out" and at the same time does not pack down so much as leaves or straw, and permits a free circulation of air to keep the crowns and soil surface dry.

CHAPTER VIII

ROCK PLANTS OF VARIOUS TYPES

WHAT is a rock plant?

From a half dozen authorities you might get as many different definitions. There are the sticklers who maintain that none but true alpine should be considered real rock plants, or grown in a rock garden. On the other hand, if one were to include everything described as a "rock plant" in some of the general seed catalogs, the conclusion would inevitably be that anything which can be grown in or near a rock garden is a rock plant.

In trying to arrive at some sort of a definition to meet our present purpose, we need be neither too technical on the one hand, nor commercial on the other. Mr. Reginald Farrer, the great English authority, gives it as his opinion that "anything that looks well and suitable" in a rock garden, "no matter where it comes from," may be classed as a rock-garden plant. Certainly this would include, on the one hand, many plants besides the true alpine, and exclude, on the other, many plants too large, too formal in habit of growth, or in other ways "unsuitable," which are often described as rock plants in the catalogs.

Another contention sometimes made is that no plant should be grown in a rock garden which may be grown equally as well elsewhere under ordinary garden conditions. Personally, I have never been able to see why such discrimination should be made. It might apply to that type of rock gardening which has as its first consideration the collecting and growing of alpine and other plants of similar character (see page 10). But where one looks upon the rock garden as a special form of

landscaping, a particular medium for the creation of a suitable picture by the use of plants—in this case associated with rocks—then any plant which will add its bit to the beauty of the general effect, and is in harmony with the spirit of the composition as a whole, qualifies as material legitimate to the hand of the artist who is creating it. And though he may be but an amateur artist, stumbling along as best he may in his own unskilled way, the case is not altered.

Take, by way of illustration, the humble portulaca, sometimes instanced as the type of flower which should never be grown in a rock garden. It is an annual, will thrive in any sunny spot—a child can succeed with it, and rock-garden conditions are not in the least essential to its culture. But it seems to me that to an unusual degree it “looks well and suitable” associated with rocks—in fact, one of the most charming and altogether the simplest rock garden I ever saw was on an ocean-side estate in Massachusetts, where the owner, a lady of unusual good taste, had used this one flower in the little crevices and among the hollows of the gray and moss-grown ledges which fortified the entrance to the place.

And so my suggestion to the beginner is that he may well leave the discussion as to what is and what is not a rock plant to the experts and the botanists, and for materials for his own rock garden pick and choose where he pleases. He must keep in mind, nevertheless, that if he is thus going to let down the bars in one direction, they must be rigidly kept up in the other—no plants which do *not* look well and suitable should be admitted; and on this basis some of the alpinists themselves will be excluded.

WHAT PLANTS ARE SUITABLE?

What checks and balances, then, are to be used in determining what shall and what shall not be allowed in the rock garden? What must a plant do, or be, to pass the gardener's scrutiny, and be permitted to join the company of the elect?

There are, I think, three tests which, used together, will come very near to sorting out the desirables from the undesirables.

Size. To begin with, we come back to one of the principles already discussed; *i.e.*, the necessity for maintaining *proportion* throughout the designing and planting of the rock garden.

We are speaking now of the plants which are to be set out among or against the rocks, not of such evergreens or shrubs as may be used as part of the design or structure of the rock garden, or in creating the setting for it. In a natural garden, where the stones may weigh many tons each, or in an artificial garden built on a very large scale, one may use taller plants, and still have them remain in proportion, than in a small rock garden such as the suburban home owner may have at his disposal. For the large rock garden, habit of growth and character will be the deciding points, rather than size.

For the small or moderate-sized rock garden, few if any plants should be employed which attain a height of over ten or twelve inches, and it is desirable to keep the majority of them well below this. Some shrubs and trees, not over three feet tall, and preferably not over two, may be allowed; but even so, they will require careful placing. A few, but very few, exceptions may be permitted without spoiling the general effect. Our native wild columbine, for instance, attains a height of two feet; but it is preëminently a rock plant, and because of its graceful and dainty growth, does not give the impression of size and bulk which would be presented by most garden perennials which grow this tall. If these taller-growing things are kept down in the valleys, and not permitted on the heights, their beauty may be admitted without throwing the picture out of proportion.

Habit of Growth. Those plants which grow naturally among rocks or in rocky places are, for the most part, quite distinct in their general appearance and habit of growth from the average run of garden perennials. Three forms are typical. Some form compact rosettes or crowns, such as the primulas or primroses and our native saxifrage (*saxifraga virginiensis*) with which most country or small-town people are familiar;

Types of Rock Plants



Aster alpinus



Primula



Primula

Growing
upright
from Tufts



Alyssum spinosum



Sedum

Forming
Mats or
Cushions



Arabis alpina



Cerastium tomentosum

Spreading
or
Running

then there are those which gradually form thick-spreading mats of foliage, densely covered with almost countless blossoms during the flowering period, such as the common sedums and the moss-pinks; still others are of creeping or trailing habit, such as the creeping thymes, or our native partridge berry, and such things as hardy candytuft, alyssum, and rockcress, which form spreading tangles of growth, hugging the rocky surfaces, and giving us, while in bloom, masses of color which are not to be duplicated elsewhere in the floral world.

Character. Character is more difficult to define than either size or habit of growth. There are some plants which would pass inspection on these points and which, nevertheless, do not seem "suitable"—as, for instance, nasturtiums and most petunias—to mention two plants which every one knows and which are frequently to be seen in so-called "rock gardens." Nor are such examples confined to the annuals—the gay, cheery-looking little periwinkle, which makes such an excellent ground cover, is one of those perennials which simply are not in the right company in a rock garden, no matter how much one may admire them, and despite the fact that they frequently find their way in. On the other hand, such a leather-necked and unkempt visitor as the native hardy cactus or prickly pear (*optunia vulgaris*), which no one would want in the garden border—even though it may easily be grown there with the assistance of sufficient sand or ashes—will find himself welcome, without a question as to his credentials.

No rules may be laid down for applying this final test of character; it is a matter of taste in selecting what is or what is not in keeping with the atmosphere of the rock garden. Fortunately, those things which are admitted and do not "belong," soon make their presence known and can be removed.

ALPINE AND OTHER ROCK PLANTS

While it may be immaterial where our plants for the rock garden come from, in so far as the effects which we create with them are concerned, their origin does make a difference in regard to the culture to be given them. For this reason, if

for no other, it is desirable to know something of the differences in the several classes of plants available for rock-garden use. But in addition to this utilitarian advantage, there is another of quite equal importance. Even though one may know little, and possibly care less, concerning botany, any plant takes on greater interest when we know something of its associations and its history. In fact, it is impossible to dissociate these from the intrinsic qualities of the plant. The edelweiss of the Alps, for instance, "without which no rock garden is complete," in the opinion of some, is but a tiny flower surrounded by a bract of white woolly leaves, which would be passed by as a modest weed if it grew by the garden path. But when one has read of adventurous spirits risking limb and life to find it blooming among the snow and ice of alpine heights, it naturally assumes an interest more than commensurate with whatever beauty it may possess as a flower. The more you know concerning your plants, whether in your rock garden or elsewhere, the better you can provide for them, and the greater the joy which they may give you.

Alpine Plants. An "alp" is a high mountain anywhere, not necessarily, as many persons take for granted, one of the range in northern Italy and Switzerland; it comes originally from the Gaelic word for mountain pasture.

True alpine plants are mountain plants from any part of the world, native to those altitudes above the timber-line, and extending as far upward as any vegetation can survive. As already pointed out, they grow where the natural drainage is exceptionally good, but where their roots are constantly supplied with moisture, mostly from melting snow and ice, and consequently nearly ice cold. The season for growth and flowering is brief, often little over one hundred days.

Logically, the nearer one may approximate these conditions in making a rock garden, the better are the chances of success with this particular type of rock plant. Those who live in northern sections, at comparatively high altitudes, especially where the growing seasons are short and snow remains on the ground for months at a time, have an advantage over the rest

of us when it comes to alpine. However, something can be done in providing conditions which will answer the purpose in other sections, as has already been explained (see page 21).

Subalpine Plants. Occasionally, in the catalogs or in rock-garden literature, we will find the term "subalpine." This applies to plants of alpine character which grow somewhat farther down the mountain slopes, below the timber line. Such are more likely to tolerate some degree of shade, and, while absolutely hardy, not so likely to enjoy standing with their feet in cold water.

Mountain Plants. Still others there are from the lower mountain regions, foothills, and rocky slopes, which possess many of the characteristics of the true alpine plants, but which naturally are still more amenable to such a home as may be provided for them almost anywhere; insisting, nevertheless, upon exceptionally good drainage, and soil which suits their wild nature, and frequently, in ordinary rich garden soil, either going to one extreme and perishing outright, like the trailing arbutus, or to the other and getting so fat, flabby, and bourgeois that their beauty vanishes, as is the case with the wild columbine. When you read in your catalog descriptions of "mountain plants," therefore, you may feel fairly certain of being able to succeed with them.

Moraine Plants. The characteristics of the natural moraine have already been described in sufficient detail (see page 36). Plants which, in your catalogs, you find specifically recommended for moraine planting, cannot be expected to give equal satisfaction elsewhere. The combination of an almost perfectly dry surface soil and a more than usually abundant supply of moisture at the roots, is not generally to be found unless there is special provision for it. Moraine plants constitute, therefore, a class which the beginner will do well to keep away from, unless he has the means for providing the special conditions they require; even then, it will be better to wait until experience has been gained with plants more easily managed.

Bog Plants. Most of the bog plants, on the other hand, are very readily handled. They grow in wet places, but not actually

in the water, like the aquatics. Note should be made of the fact that there are many alpine and rock plants recommended "for moist situations," or "moist soil," which are not bog plants; that is, they will not thrive where there is water standing in the soil, as the genuine bog plants, such as the marsh marigold, or pitcher plant, do. Many of the bog plants which, in their native locations, are covered with water for several months of the year, will get along nicely in much less moist (but not dry) situations. The native iris and the cardinal flower are examples of these. The bog garden, however, is not logically a part of the rock garden. Many plants often included in alpine and rock plant lists, which really belong to the bog garden, merely serve to confuse the beginner. If one is starting out to make a rock garden, there is no necessity for wandering frequently or far into the swamps in search of material for it.

A GENERAL LIST OF PLANTS FOR THE ROCK GARDEN

In the last chapter of this book there is presented a list of the most satisfactory and easily grown rock-garden plants. This list, like most catalogs on the subject, includes plants from all of the foregoing groups. In most books on rock gardening, a large part of the space is devoted to the description of plants, and of individual varieties. This is as it should be, and to those who are taking up seriously this fascinating form of gardening, the acquisition of at least one or two of these larger volumes is by all means recommended. In this little book, however—as in its companion volumes of *The Home Garden Handbook* series—only a limited list of varieties can be described, the reader being referred to the catalogs, rapidly increasing in number and in excellence, now making a special feature of rock-garden plants, and in many instances devoted chiefly to them.

In addition to this general list, there will be found in the last chapter a number of lists of plants recommended for various purposes and conditions.

CHAPTER IX

BULBS FOR THE ROCK GARDEN

To one who thinks of bulbs in terms of Darwin tulips with three-foot stems, and the modern Giant Trumpet daffodils, in the spring garden, or of gladiolus and dahlias throughout the summer months, the rock garden would seem to offer no suitable place of residence for this important group of flowers. Many "complete" catalogs of rock garden plants contain never a whisper concerning bulbs, though often including shrubs and evergreens.

It may be argued that the bulbous flowers, even when dwarf enough to merit a place in the rock garden, are not sufficiently similar in habit of growth to other rock plants to entitle them to recognition. This, of course, is a matter of taste and not to be dogmatically settled one way or the other. The contention that bulbs are not legitimate subjects for the rock garden has had more weight abroad among the advocates of alpine gardening, pure and undefiled. In most American rock gardens, bulbs have been made welcome, and are likely to be used more rather than less in the future, as knowledge concerning them becomes more widespread. For one thing, they may be successfully grown over a much wider range of climatic conditions than the true alpines.

BULBS SUITABLE FOR THE ROCK GARDEN

But the fact that there are some bulbs which may be welcomed into the rock garden, makes it no less necessary to have them qualify as to size, habit of growth, and character.

The first point is easily settled. The veriest novice at rock gardening would hardly think of including Darwin tulips or

gladiolus; in general, 12 or 15 inches will mark the limit in height.

Failing to pass in habit of growth and character, are such obviously formal things as hyacinths, double tulips, and most of the Early and Cottage varieties—even most of the daffodils are a bit too bulky and stiff and garden-border looking.

But, fortunately, we have left a most gay and companionable



Grape Hyacinth



Dwarf Iris

little company which includes such things as the smallest of the daffodils, which are lost among their more robust sisters in the garden border, even though they may be grown there; many of the fascinating little tulip species; the trooping company of the brave-hearted "minor bulbs" which come to meet the spring almost before the earliest of the rock plants have opened an eye—the grape hyacinths, snowdrops, scillas, chionodoxas, and dainty little wild crocuses. I should never want to be without these little treasures in my rock garden, even though it were located where all the most difficult and rare alpine might be

grown. And there are many others equally desirable, including numerous native American species which are gradually becoming available, to extend the season of little bulbs in the rock garden from the grape hyacinths, through the later blooming scillas, to the autumn flowering crocuses in the fall.

PLANTING BULBS IN THE ROCK GARDEN

The location to be given such bulbs as may be used in the rock garden is a matter for consideration. Many of them like best a sequestered and sunny little nook, sheltered from north and west by a neighboring rock, so they may look out early in the spring and yet be somewhat protected from the tearing fingers of the March wind, and also bake nicely when they go to sleep for the summer later on. The flowers also show to best advantage against a rock at a season when the ground is mostly bare and brown.

Then too, something may be done towards protecting them from being beaten down and soil spatted in the onslaught of March and April storms, by providing them with a ground cover of some sort, or if there has not been time to provide that, stone chips and peatmoss, which will not spatter like soil. For the sorts with fairly large foliage, such for instance as the Heavenly Blue grape hyacinth, one must take into calculation that the leaves will occupy some space for several weeks after the flowers have departed; so do not put them where they will be in the way of choice small things, or where the space might be used more advantageously for something else.

Below is a brief list of some of the species and varieties of bulbs suitable for planting in the rock garden; while not complete, it yet presents a considerable range from which selections may be made, and indicates the type of bulbs which may be used if one cares to experiment further in this direction.

Alliums: Small heads of mauve and reddish flowers on stems 6 to 12 inches tall; *Cyaneum*, dwarf and blue, and *Moly*, bright yellow, are two of the most satisfactory.

Bulbocodium: Cheery little rosy purple flowers two weeks ahead of the crocuses.

- Chionodoxa** (Glory of the Snow): One of the joys of early spring; *Sardensis* gives us the first note of blue in the spring garden; there are other pale blue and white forms flowering later.
- Calochortus**: The "Butterfly-tulip" of delicate shades of rose, white, lavender and primrose; grows to 18 inches tall; full sun and gritty soil; hardy with protection.
- Colchicum**: Autumn flowering bulbs, excellent for the rockery, especially with sedums, saxifrages, arenarias and other low growing rock plants; will do well in partial shade.
- Crocus**: The ordinary bedding varieties, if used in small groups will answer, but the species are better for the rock garden; these include the early crocus (*C. imperati*) and *C. tommasinianus*, blooming in March or even in February; the Scotch crocus (*C. biflorus*); and Cloth of Gold (*C. susianus*) a few weeks later.
- Eranthis hymenalis** (Winter Aconite): One of the very earliest to bloom, and a bright pure yellow; prefers moist soil even in partial shade; long season of bloom and beautiful foliage; most satisfactory.
- Erythronium** (Dogwood Violets or Trout-lily): Excellent native plants for shade spots; several species, all good; *dens-canis* is earliest; give leafmold soil and mulch during summer.
- Fritillaria meleagris** (Checkered-Lily): These queer and quaint little checkered, nodding bell flowers, growing about a foot tall and blooming in April, breathe the rock garden spirit and are easy to establish; *pudica* is a yellow variety, doing well in gritty soil; *recurva* is a good variety for the rock garden.
- Galanthus** (Snowdrops): One of the earliest, with dainty bell-like flowers, especially charming among small rocks; good for sun or shade; *muralis* is the hardiest variety, but except in the extreme north, *elwesii*, much larger, may also be grown, especially if given a winter mulch.
- Leucojum** (Snowflake). Similar to the snowdrops but of stronger growth. Spring snowflake (*L. vernum*) blooms in March or April; *aestivum* in May or early June; *autumnale* in September or October—all very satisfactory.
- Muscari** (Grape Hyacinth): Always satisfactory; they should be among the first bulbs secured for the rock garden; *azureus* is the earliest; Heavenly Blue, the largest flowered; there are several others, all good for the rockery; they increase freely, often from self-grown seed.
- Narcissus**: Most of the garden sorts are rather too large and border-like for the rock garden; but among the species, which naturalize exceptionally well, are some of the most pleasing of all rock garden plants; these include *narcissus minimus*, the smallest of all, usually less than half a foot tall; *minor*, but slightly larger; *triandrus albus*, the "Angel's Tears" daffodil; *calathinus*; *bulbocodium*; *cylamineus*, distinct with its cyclamen-like flowers, and numerous others; of the varieties of the garden or Trumpet daffodil, *Cervantes*, with me always the earliest to bloom, is but a foot tall; and *W. D. Milner*, later and cream colored, has a quaintly drooping habit; all prefer rather moist, cool soil.

Scillas (Bluebells): Hardy and fine for naturalizing, remaining undisturbed for years; Siberian Squill (*siberica*) and *bifolia* are early—February or March—6 inches tall; the English Bluebell (*S. nonscripta*) and the Spanish Bluebell (*S. hispanica*) are taller and later; do well in sun or in considerable shade. Place the scillas near the top of your list.

Tulips: As with the narcissus, it is to the species rather than to the garden sorts that we must turn for the rock garden; they like rather hot, dry locations; *T. dasystemon*, yellow, and *greigi*, vermillion and *sylvestris*, yellow, bloom in April in the order named; the latter is fragrant and increases rapidly; *clusiana*, the Lady Tulip, with tiny pointed white flowers and a carmine feather up the center of each outside petal, is extremely hardy and easy to grow; try this if no other; *kaufmanniana*, pale yellow, is the earliest of all to bloom; and *sprengeri*, orange scarlet, the latest—in late May or June.

TENDER BULBS

For obvious reasons, it is desirable to use in the rock garden only the hardy or perennial bulbs which will establish themselves and flower season after season with little care. Sometimes, however, there may be occasion to use something for immediate results, as a temporary substitute, especially in the new rock garden. Among those most suitable for this purpose are the zephyranthes or Fairy Lilies; tigridia or Tiger Flower, *cooperia*, the Texas Evening Star, with sweet scented waxy white flowers, and the various oxalis. All are satisfactory as "pinch hitters"; they have this further advantage, also, that they bloom throughout summer and fall long after most of the other bulbs are taking their summer's nap.

CHAPTER X

EVERGREENS AND SHRUBS FOR THE ROCK GARDEN

DWARF evergreens and dwarf shrubs will help to produce the illusion of naturalness in the rock garden to a greater degree than any other form of plant materials, if they are used in the right way. There are very few rock gardens, indeed, regardless of their size or character, which cannot be made more attractive by the addition of some of these dwarf plants.

The most serious problem in connection with their use is indicated in the four words above—"in the right way," for these are plants quite as effective in destroying whatever naturalness there may be as in adding to it. Unless suitable types are selected and so placed that they do not look formal or artificial, it is far better to omit them entirely; and placing them where they will contribute the desired effect is no easy matter; it requires good judgment, taste, and, above all, an eye for composition.

To begin with, we must keep in mind that these plants are to be used not primarily for themselves, but to supplement the rocks in creating an environment for the rock plants. The rocks and the dwarf trees form the setting of the stage, and the placing of both should be studied with the same painstaking care.

In selecting the dwarf trees and shrubs which are to be admitted to the rock garden, we may apply the same tests already presented (see page 47). They should pass muster as to size, habit of growth, and character.

Height. It is not necessary to stay within the limit set for

the rock plants, but it is most essential to maintain rigidly our sense of proportion. Excepting in the very smallest of rock gardens, we may employ conifers towering to the sky-scraping altitude of two or occasionally three feet. The beginner may be surprised to learn that there are a number of perfect tree-like little specimens which do not grow taller than this. Even with these giants, the greatest care must be taken not to place the largest of the rock plants in close proximity to them.

Habit of growth is equally important. There are, for instance, many of the dwarf evergreens of such perfect globose form that they look almost as though they had been turned out of a mold. While excellent in formal gardening, these are not in keeping with the rock garden. Such strictly formal things as clipped or shaped dwarf evergreens or box bushes, it hardly need be said, should never be allowed near the rock garden. Some of the low-growing, spreading evergreens, as certain of the creeping junipers, while not too tall growing, are still too coarse in habit, eventually making plants which are so large in diameter, if not in height, as to look out of place.

The character of such evergreens or shrubs as may be used in the rock garden is, if anything, more important than the character of the individual rock plants. They show up more conspicuously, and are in evidence throughout the entire year. Dwarf forms of the tall-growing coniferous evergreens, such as spruces, pines, and firs, are generally somewhat picturesque in character and will suited to rock-garden planting. Where one can visit a nursery personally, it is sometimes possible to find specimens which are "imperfect" from the nurseryman's point of view, unevenly developed, crooked, or otherwise "deformed" which are admirably suited for rock-garden planting. These not only make most desirable subjects, but as a rule are to be had at a much lower price—if one does not appear overanxious to get them. I know of one rock garden, famous for its Japanese effect, which was planted largely with such undesirable specimens from an old nursery. The Japanese create character and the appearance of great age by skillful training and pruning; there is no reason why the rock gardener should not

experiment in this direction, but if it is a new field to him he must be prepared to make mistakes, and possibly to spoil some plants.

EVERGREENS AND SHRUBS FOR THE ROCK-GARDEN BACKGROUND

The suggestions above apply to evergreens and shrubs used in the rock garden. Those used for forming *the background or setting* for the garden are not subject to the same restrictions, particularly as regards height. Nevertheless the transition from the small scale on which the rock garden is planned to taller trees in the background should not be made too suddenly; and whatever is to be visible from the *interior* of the rock garden should be in keeping as to character. The graceful drooping fronds of a hemlock, or the irregularly spreading branches of a pine, will give no sense of jarring contrast, such as would be inevitable in the use of trees symmetrically columnar or pyramidal in habit, or of the blue or yellow or golden forms which are so patently the result of the horticulturist's art.

PLACING TREES AND SHRUBS IN THE ROCK GARDEN

It is quite as impossible to give any definite directions for the placing of trees and shrubs to be used within the rock garden as it would be to pen a few paragraphs informing the reader how to paint a picture. Even the builder of the rock garden himself cannot tell in advance where these plants will go; he must feel his way as the work progresses, putting them here and there in imagination, and frequently placing and replacing the plants themselves, before actually planting, until he is fairly satisfied that they are located where they will give the effect desired, or as near it as can be obtained.

The best time for placing evergreens and shrubs in the construction of the rock garden is after the outlines of the rock work have been pretty well completed, with the largest stones and the most prominent stone groups in place, but *before* the finishing touches are added. This is advantageous both as to the mechanical details of planting, and also in the design or

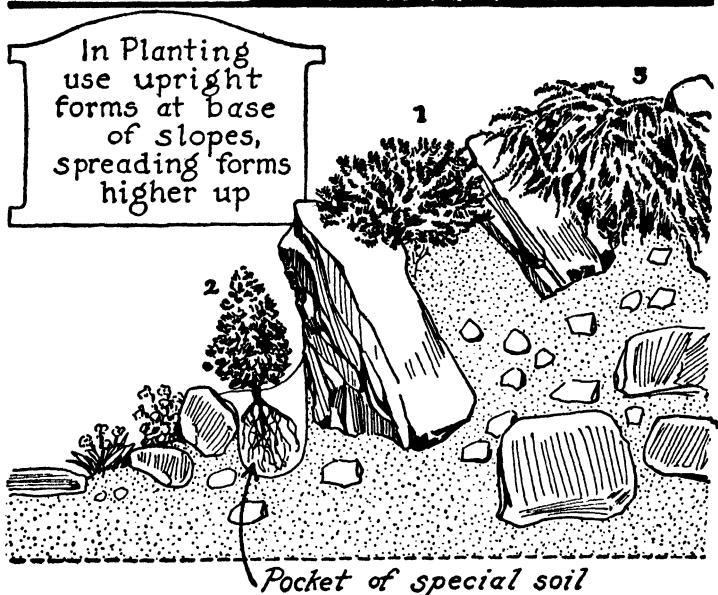
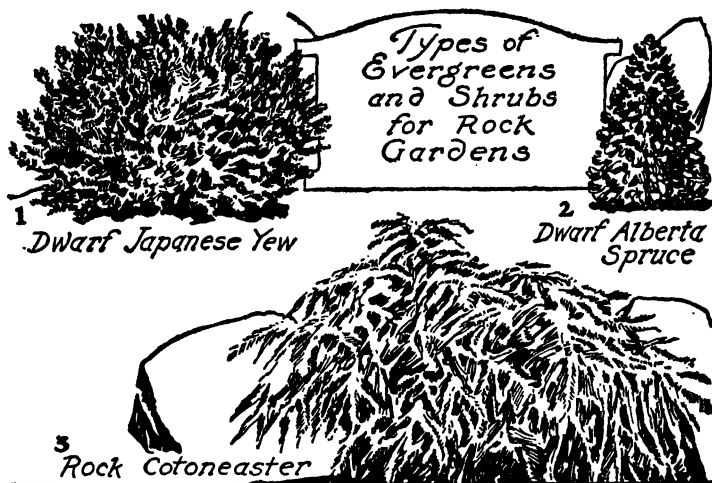
arrangement of the garden, as the trees are more likely to look as though they really belonged with the rocks, and not merely stuck in as an afterthought.

In habit of growth, most of the dwarf trees and shrubs belong to one of three general types: the upright growing, true dwarf tree form, such, for instance, as the Dwarf Alberta spruce or Dwarf Irish Juniper; those of dwarf shrubby or bushy growth, such as Dwarf Japanese Yew, Dwarf Mugho Pine, or Spreading Cotoneaster (*C. divaricata*); and those of procumbent or creeping habit, such as the Gray Carpet Juniper (*J. sabina tamariscifolia*) and the Rock Contoneaster (*G. horizontalis*).

As a general rule, the dwarf-tree forms are most effective when planted on the lower levels of the rock garden, or directly against the bases of the large rocks which rise above them; the shrub-like forms against or among large rocks, perhaps a bit higher up where they may find a suitable background in the stones about them, or, if of drooping habit, may fall gracefully over the stone surfaces; and those of creeping or horizontal habit of growth, where they may form a mantle either against the base of the rock surfaces, or by trailing down about them from above.

EVERGREENS

Aside from the dwarf spruces, of which there are several, there are comparatively few really dwarf evergreens. The larger-growing sorts look so enticing during the earlier stages of growth, when they are still small, that it is often hard to resist the temptation to use them. This should be done, however, only when it is planned to shift them to other quarters later on. This is readily accomplished if they are planted in places where they can be taken up again without disturbing too many other things—especially if they are set out in the wire mesh planting baskets which are now available, and by the use of which a small shrub or tree may be taken up at the end of a couple of seasons' growth with the ball of roots in a compact, solid mass. The suggestion above is not made with the idea that it should be followed as a general practice; but it does offer a means of obtaining a fairly satisfactory substitute



for dwarf evergreens in the rock garden for the first season or two if one cannot buy all the plants desired at the very start.

The truly dwarf evergreens are really most delightful little trees in themselves, as well as being particularly effective units in the rock-garden picture. Even so few as two or three of them will give the garden a certain character which it is impossible to obtain with anything else. The following list contains some of the most suitable evergreens and evergreen shrubs.

EVERGREENS AND EVERGREEN SHRUBS

VERY DWARF, FOR USE WITHIN THE ROCK GARDEN

Evergreens

The Dwarf Spruces: These are really the most useful of all the dwarf evergreens. They are now being grown much more generally, and several beside those mentioned can be obtained with little difficulty.

Dwarf Alberta Spruce (*Picea glauca conica*): Real, miniature spruce form; very dense growth; requires many years to attain a foot in height.

Pygmy Norway S. (*P. e. pygmaea*): True dwarf tree form, usually less than two feet; compact, dense growth.

Dwarf Balsam Fir (*Abies balsamea compacta*): Best of the dwarf firs; very hardy; spreading habit of growth; like most firs, prefers moist soil.

Dwarf Mugho Pine (*Pinus montana mughus*): Too large for inside the small rock garden, but very variable in habit of growth, and appropriate specimens may be found by personal selection; the true dwarf form (*compacta*) is better for rock garden use, if specimens are selected which are not too symmetrical.

Dwarf and Low Junipers: Most of the junipers are too strong growing for the small rock garden; they will, however, stand a good bit of pruning, and for rock-garden purposes it does not matter if, as the result of this, they do not develop into symmetrical plants. The varieties which may be used include the following:

Koster Redcedar (*Juniperus virginiana kosteri*): In form of growth something like the popular Pfitzer Juniper, but much smaller.

Sargent Chinese Juniper (*J. chinensis sargentii*): Prostrate habit; valuable especially for its good, green color.

Japanese Trailing Juniper (*J. japonica procumbens*): Usually remaining under a foot in height; blue-green color; very hardy.

Gray Carpet Juniper (*J. sabina tamiscifolia*): Bluish gray-green; less coarse than most spreading junipers.

Squamata Juniper (*J. squamata*): Most Japanesque of the prostrate junipers; bluish gray-green; irregularly sprawling branches.

Dwarf Irish Juniper (*J. communis hibernica nana*): Dwarf columnar form, but with character suitable for rock work; most effective.

Evergreen Shrubs

Azaleas: Most of the azaleas, as they grow naturally, are too large for the small rock garden. However, they are easily controlled by pruning after the plants flower. The two best known are: *Azalea amœna*, with bright, rosy purple flowers in May, and *Azalea Hinodegiri*, an improved form of *amœna* with scarlet flowers. Some of the newer forms are dwarfer in growth. *Benigiri* has bright red flowers; *Hakalatashiro*, snow-white single blossoms; *Maxwelli*, single carmine blossoms, is one of the hardiest varieties; as is also *azalea indica roseflora*, double orange.

Wintergreen Barberry (*Berberis julianae*): An all winter bit of greenery which can readily be kept any desired size by pruning.

Cotoneaster or Rockspray: As the common name would imply, these are among the most suitable of all shrubs for the rockery. Horizontalis, of evergreen tendency, is the best known; spreading, drooping branches give a distinct spraylike effect; the red berries are held through the winter. The Dwarf Rockspray (*C. microphylla*) is prostrate in habit. Box Rockspray (*C. rotundifolia lamata*) and the variety *glacialis* are the smallest.

Tree Ivy (*H. h. conglomerata*): Has peculiarly twisted crowded foliage and is of prostrate habit; very picturesque.

Dwarf Euonymus (*E. radicans minimus*): Another tiny-leaved little creeper that will scale a cliff a foot in height.

Heather (Heath): The common Heather (*calluna vulgaris*) thriving in sandy soil in either sun or partial shade, is available in many varieties which are hardy to New England. The dwarf, wiry growth and quaint blossoms make them great favorites wherever tried. *Erica carnea*, available in either pink or other colors, attaining a height of 8 inches or so, is not quite so hardy.

Laurel: Mountain-laurel (*Kalmia latifolia*) is too large. Sheep Laurel or Lambkill (*K. angustifolia*) is one of the most charming of all small shrubs, and the Bog Kalmia (*K. polifolia [glauca]*) are available.

Rocky Mountain or Creeping Hollygrape (*mahonia repens*): A good creeper for the shade, but to be used cautiously, as it spreads.

Rose Daphne (*D. cneorum*): One of the most beautiful of all dwarf shrubs; with small fragrant pink flowers.

OF DWARF OR MEDIUM HEIGHT, FOR THE BACKGROUND OR FOR NATURAL ROCK GARDENS ON A LARGER SCALE

For this purpose, with the restriction of height largely removed, a much wider list may be selected from, and therefore there is no need to present one in detail here. Those mentioned

are more in the nature of examples suggesting what may be used than any attempt at a complete list.

Evergreens

Arrowhead Norway Spruce (*Picea excelsa conica*): A fine semi-dwarf evergreen, ten or twelve feet.

Japanese Umbrella-Pine (*sciadopitys verticillata*): 12 to 15 feet; distinct, very Japanese.

Swiss Mountain (*pinus Montana*); taller-growing form of the well-known Mugho pine.

Pines (Various): Many of the other pines are well suited to background planting for the rockery. The Jack Pine (*P. banksiana*); the Shrub Pine (*virginiana*) and the Limber Pine (*flexilis*) being especially desirable.

Hemlocks: The hemlocks are, by nature, rock associates, and the happiest of all evergreens to use near the rock garden; prefer a rather moist, peaty soil; may be used in the shade.

The Smaller Evergreens—redcedars, junipers, yews, arborvitæ, and cypresses (*chamaecyparis*), are all generally available, if one avoids the artificial-looking colored or too symmetrically shaped horticultural varieties. The Japanese Temple Cedars, *Cryptomeria japonica* and *lobbi*, both of which are very Japanese in effect; Deodar Cedar (*Cedrus deodara*); Lawson Cypress (*Chamaecyparis lawsoniana*) which is hardy to New York; and Moss Sawara Cypress (*Cham. pisifera squarrosa*), of plumelike foliage, and slow growth, are among the most effective.

Evergreen Shrubs

The introductory remarks above, concerning evergreens, apply equally to the evergreen shrubs. Almost all of them, if they are too tall to be used within the rockery, may be allowed just over the fence looking in, but care must be exercised to avoid too many varieties or too extensive masses of them; otherwise we may have a show ground of rhododendrons or azaleas instead of a rock garden.

DEDIDUOUS TREES AND SHRUBS

VERY DWARF, FOR USE IN THE GARDEN

The deciduous dwarf shrubs are not nearly so essential in rock-garden planting as the evergreen sorts, but there are a few which are very desirable and a number may well be used. Here are a dozen or so of the most important:

Daphne mezereum: Dainty and beautiful; blooms early spring, often again in late autumn. Somewhat sheltered location; usually not over two feet. Also *D. genkwa*.

Box Barberry (*Berberis thunbergi minor*): Two to three feet; small yellow flowers and conspicuous berries; hardy to Massachusetts.

- Cotoneaster (Refer to preceding list).
 Dwarf Birch (*Betula nana*): Charming little trees; unsurpassed with the dwarf evergreens; about three feet.
 Genista: Golden flowers in June; unequaled dwarf shrub for poor, dry soil; easily grown from seed.
 Dwarf Huckleberry (*vaccinium*): All charming, with dainty drooping flowers; grow in dry, sandy soil.
 Dwarf Willow (*Salix bryacarpa*): Has gray foliage and yellow bark. *S. repens*, a creeping form, with silvery leaves.
 Rhodora (*R. canadensis*): A tiny rhododendron, two to three feet tall.
 Roses: Several of the species are desirable; among the most dwarf are the Virginia rose (*R. lucida*), the Bristly rose (*R. nitida*) and the Pasture rose (*R. humilis*).
 Star Magnolia (*M. stellata*): A little gem, early, and very hardy.
 Viburnum carlesi (*Fragrant V.*): Taller than many other things in this list, but in every way desirable.
 Waxmyrtle (*myrica carolinensis*): Another plant for poor soils.

DWARF AND MEDIUM HEIGHT FOR BACKGROUND, OR IN NATURAL
 ROCK GARDENS ON A LARGE SCALE

Here again the list to select from is a wide one, and the problem is not so much what to take as what not to use.

- Azaleas: Any of the hardy deciduous azaleas are available, but it is easy to overdo them. In most types of landscaping, azaleas and rhododendrons should be used in masses; in rock gardening a single plant often better answers the purpose.
 Dogwood: The native Flowering Dogwood (*Cornus florida*), is in character of growth admirable for the rock garden; it is possible to keep the trees at any height by pruning for lateral growth.
 Forsythia: Most varieties rather large and coarse. *Suspensa sieboldi* is the lowest growing and most graceful.
 Goldflower (*Hypericum moserianum*): Good for yellow flowers in midsummer; variety *Buckleyi* is more dwarf and spreading.
 Highbush Blueberry (*Vaccinium corymbosum*): The natural growth of this fine native shrub is often such as a Japanese gardener might spend a lifetime in achieving; few plants are more picturesque.
 Rhododendrons: Almost too large and too heavy even for the background, excepting in rock gardens of large size. The Myrtle rhododendron (*myrtifolium*), Wilson rhododendron, thriving in sun or shade (both of which are hybrids of *r. minus*) and ovatum, are dwarf alpine forms.
 Roses: Several of the taller-growing species, not mentioned in the preceding list, such as Hugonis and the Redleaf Rose (*r. rubifolia*) with its small starry blossoms, carry the spirit of the rock garden.
 Tamarix: I have never seen this shrub recommended for use in rock gardening, but it is particularly pleasing and effective; its feathery sprays of pink blossoms may be enjoyed from spring until

late summer by using the several varieties; *africana*, the earliest; *gallica*, blossoming in midsummer, and *indica* in late summer.

Witch-hazel: Our common Witch-hazel (*hamamelis virginiana*) frequently found growing on rocky hillsides, unfurls its graceful little tasseled yellow bells in late October or even in November, and in January or February the Vernal Witch-hazel (*h. vernalis*) bursts out impatiently; the Chinese Witch-hazel (*mollis*) follows a bit later; the Japanese is impartial, and flowers either in latest autumn or in earliest spring; plant against evergreens; semi-shade will do.

CHAPTER XI

GROWING FROM SEED AND OTHER METHODS OF PROPAGATING PLANTS

IT is quite possible to buy all the plants one is likely to require for the making of a rock garden, small or large. With the rapidly increasing number of concerns who sell rock plants, and the ever improving lists of varieties available, it is no longer necessary to grow one's own plants. Not so many years ago growing from seed was the only way to try most of the wonderful things described in English catalogs and books on rock gardening—then the only ones available on this subject.

But though the necessity may be less, the fun which the rock gardener may get in growing at least some of his own plants is as great as ever. There is fascinating work in connection with any kind of gardening, but in rock gardening I think most of all.

Quite aside from the enjoyment to be derived, there are several practical advantages. Growing one's own plants affords an economical way of increasing the stocks, even if the varieties already on hand are to be used. It makes possible experimenting with many new or rare varieties not otherwise readily obtainable—the entire world, in fact, becomes your pasturage for new plants of beauty or of interest for the rock garden. And then there is the further advantage—which to me has always seemed to be the most important—that in the more intimate contact necessary with the plants, in propagating them yourself, you come to know their requirements and preferences, their little peccadillos and idiosyncrasies, much more thoroughly—and sympathetically.

Most beginners at rock gardening have already had at least some experience with other plants, and with gardening in general. They can, therefore, look forward with the assurance of success to the propagating of a great many of their rock plants if they care to undertake this work. The methods of propagation are, in general, similar to those employed for perennials, *i.e.*, by seeds, by division, by layering, and by cuttings. But a word concerning each of these, as they apply particularly to rock-garden plants, may be of some service.

GROWING FROM SEED

Of the four methods of propagation mentioned, growing from seed is perhaps the most useful, and certainly the most exciting, as each trial with a plant that has not been grown before is a new adventure into a land of mystery, in search of unknown beauty. For what treasures may these little paper packets, come, perhaps, from across oceans and far-away continents, with their magic contents, bring to you:—fairy flowers from the mountains of the world, which neither you nor your friends have ever seen before.

If you are going to try growing seed at all, make up your mind in advance to one thing—that you will make a success of it! And to that end, leave no stone, or necessary forkful of soil, unturned.

The sowing of seed in the open is often suggested; and the readiness with which many of the rock plants seed themselves is cited as evidence to the fact that they may easily be so grown.

Lay not that flattering unction to your soul! Give the seed which you are going to plant every possible chance for making good. And that means providing them, if you do not happen to possess a greenhouse, at least with the protection of some sort of frame.

A Frame for Seed Sowing. A frame is not needed for protection from the cold, as most of these plants are among the hardiest of the hardy. But in nature, they do not have to contend with dogs, cats, moles, mice, inquisitive children, careless workmen, and a hundred other dangers which civilization

brings to them. Moreover, a frame affords protection from beating rains or pelting thunderstorms, drying winds and broiling sun, which frequently work havoc, if not destruction, with the tiny seedlings. Why take chances with any of these—when the simplest sort of a frame, which need not necessarily have even a glass sash, will provide insurance against them?

If you happen to have a coldframe available, that may be used; but it is better to make a frame especially for your rock-plant seedlings. If this is constructed against a fence or a wall, three feet will be a convenient width, as all the reaching will have to be done from one side. A half sash or "pony" frame, with sash three by three feet to fit it, may be purchased complete; or both frame and sash may be home-made. The former is easily constructed with one-inch boards, held in place by light posts. The latter may be light wooden frames, covered with plant-protecting cloth, or celloglass, which is light, convenient to use, not brittle, and perfectly suitable for keeping out storms and keeping in moisture. If the sash are hinged at the back, to fasten up with a hook out of the way when not wanted, it will be found a great convenience. Mrs. Wilder's frames, which are covered with glass sash, are so arranged, thus doing away with all lifting and the danger of breaking glass in moving them about. The frame which I use for starting this type of plants is of the standard six-foot width, but facing or sloping to the *north*, instead of south, so as not to catch but to deflect, the sun's rays.

In addition to the glass sash or celloglass sash, for keeping out stormy weather, there will be needed also some form of shading, which is quite as necessary as the other. Light wooden frames, of a size which will just cover either one or two of the glass sash, may easily be made from one by two inch strips, and covered with ordinary plastering lath spaced their own width apart.

Soil. Perfect drainage is just as essential in the frames as in the rock garden itself. Dig out six or eight inches of soil, and fill in with a six-inch layer of gravel or cinders; fill in over this with a mixture of one-third each of sand, granulated peat-

moss, and light garden loam. Then top off with two inches, one-half sand and one-half peatmoss, screened to make it loose and fine. For lime-loving varieties, agricultural lime, at the rate of a quart or two to the bushel, may be added.

Sowing the Seed. The seeds of many of the rock plants in nature remain in the ground over winter, and start, almost under the melting snows, in the spring. They may be planted, therefore, in the autumn (late October or November), covered with leaves, and left until March, when the bedding is removed in time for them to get up. Others should be planted just as early in the spring as possible; so as to allow a full growing season before their first winter; for they must be firmly anchored by their long roots to prevent "heaving out" in climates where there is danger of alternate freezing and thawing—a danger which they are not subjected to in their native haunts.

One of the difficulties in growing alpine and rock plants from seed is that many of the varieties quickly lose their vitality. It is best to order seeds of these some time in advance, so they may be sent to you by the seedsman or the collector *immediately the fresh crop is available*. Some sorts should be sown as quickly as possible after they are gathered. Directions, which usually accompany the seeds, should be carefully followed.

Several hours before you expect to sow the seed, give the bed or frame a very thorough watering. If the soil is not quite dried off by the time you are ready to sow, an additional sprinkling of the prepared soil, a quarter of an inch or so in depth, will permit the beginning of operations, and will absorb moisture from the soil below so that it will not be necessary to water on the surface while it is absolutely dry, and will not soak up the moisture quickly where it falls. Most of the seeds are so small that they will need covering barely from sight, with fine sand. The very smallest should be merely pressed into the surface. Those of measurable size should be covered to a depth of about their own thickness.

While the soil should never be allowed to actually dry out,

it must be remembered that these plants dislike water on the surface of the soil as much when they are in the baby stage as when full grown. Particular care should be taken to water the small seedlings only on bright days, so that the foliage will have a chance to dry out thoroughly by evening. The ordinary American can is not at all suited to watering delicate seedlings; the oval English pattern, with a very fine spray and a long spout, making possible the application of water without having it fall from a distance above the plants, is better. But I consider the special hose nozzle, described on page 40, far superior to either, and it costs but a fraction as much as one of the imported watering cans. It will do all that the latter can do, and besides has many other uses.

Germination. Some of the seeds come up in a few weeks; a few, in fact, in less than ten days, where conditions are favorable; others, as we have seen, require several months. It is well to group them, when planting, upon this basis, so that all those which will be ready for transplanting early may be removed together.

In one group, for instance, may be planted the following, which will usually germinate within three weeks and be ready for transplanting within three to six weeks more:

Alyssum, arabis, aubrietia, arenaria, armeria, achillea, anthemis, bellis, columbine (aquilegia), cerastium, delphinium, draba, erinus, forget-me-not (myosotis), gypsophila, linaria, linum, lichnis, lupine, pansies, poppies, potentilla, silene, saponaria.

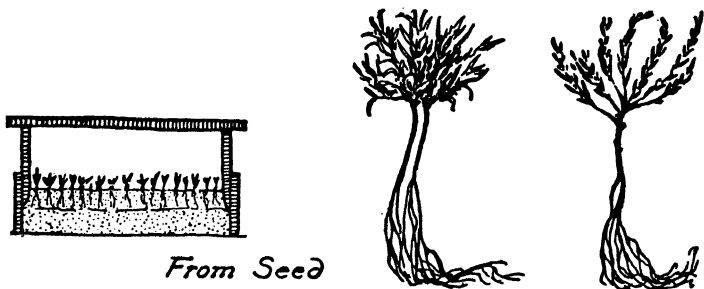
Those which are likely to take longer, some of them six to eight weeks, are as follows:

Aster, androsace, allium, asperula, campanula, clematis, coridalis, cutisis, erodium, eryngium, erigeron, genista, geranium, geum, helianthemum, heuchera, houstonia, hypericum, iberis, iris, oenothera, primula, saxifrage, sedum, thymus, thalictrum, viola.

The above, of course, are based on early spring planting. Time out, for seeds which stratify in the seed bed over winter, does not count.

These over-winter seeds need no protection from snow—the more snow which piles up in the frames the better. The sash may be left on, but not closed tight, during November and December, to protect the seeds from the heavy rains which often occur at this season.

Bog Plants. Bog-plant seeds germinate best upon a surface not only moist but actually damp. A mixture of one-third each chopped sphagnum moss, peatmoss, and sand makes a good compost in which to grow them. If this is placed in seed pans or azalea pots, and these are kept in deep saucers con-



From Seed

stantly filled with water and sheltered from direct sunshine, the seeds will have conditions to their liking.

Transplanting. If the soil mixtures suggested above have been used, there will be few weeds to bother with, and unless the seed has been sown too thickly, little thinning will be necessary before the seedlings are big enough to transplant. If they come up too thickly, however, *thin out immediately*. This is most important.

For transplanting, make a bed in a well-drained spot, using a compost for the top four to six inches, or digging into the soil, if it is light, clean garden loam to start with, a layer equivalent to two to three inches of peat moss, an inch or so of sand or fine gravel, and a little *very* thoroughly decomposed manure. If the latter is not available, leafmold and a light dressing of bone meal may be used as a substitute for it. This amount of material added will somewhat raise the level of the

bed, which is desirable. A six-inch board, bricks laid end to end, or small stones, will hold it neatly in place. Transfer the little seedlings carefully, placing them four to six inches apart each way, according to their size and the length of time they are likely to remain before being transferred to their permanent position in the rock garden or elsewhere. Here, again, the lath screens for shading come into play; supported on a low framework a foot to a foot and a half above the surface, they will protect the little plants from too much sunshine and break the force of beating rains. For some of the plants, such as the thick, woolly-leaved alpine, which are particularly sensitive about coming into contact with moist soil, a little fine gravel can be worked about and between them, after transplanting. What has already been said about watering continues to apply.

PROPAGATING BY DIVISION

Many of the rock plants, like the majority of the perennials in the hardy border, may readily be increased by separating or dividing the old plants or clumps.

But there is this difference: that whereas the border perennials may be immediately replanted in the border where they are to grow, much more certain and satisfactory results are to be obtained with rock plants if the little divisions are given an incubating period of two to three months where they can become strong, well-rooted plants, almost certain to live wherever one places them. This does not involve much extra work, and instead of losing time, actually saves it, for divisions so treated will be far ahead of those placed immediately in the rock garden, and severely checked, if they do not perish, before they become firmly established.

The divisions may be grown in a bed, but pot plants, obtained as follows, are more satisfactory.

Fill three and a half or four-inch pots with the general soil mixture described on page 43, or with any other which suits the particular variety being propagated, pressing the soil firmly down into place.

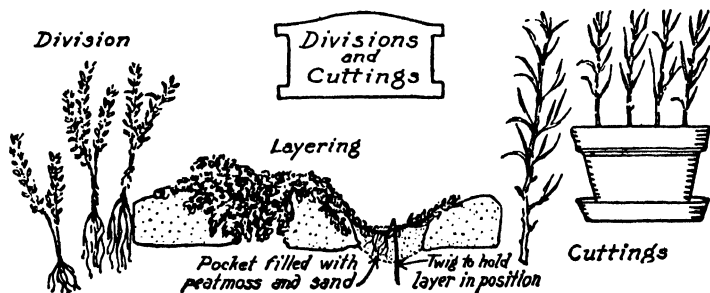
Dig out a bed in a sunny well-drained location, six inches

deep, three feet or so in width, and sufficiently long to accommodate the number of pots being used. Fill this excavation level full with sifted coal ashes, thrown in loosely, and "plunge" or bury the pots up to their rims, packing the cinders firmly about them. It is well to separate the plants into two groups, if there are many of the shade lovers among them, so that shade may be provided for these. The entire bed should be shaded by the lattice screens already mentioned for two or three weeks during bright weather. Watering should, of course, be regularly attended to, but it will be found that the cinders, while providing excellent drainage, will remain moist for a long time after each watering. I have not yet had an opportunity to try the new peat pots for this purpose, but anticipate good results with them. In planting, the pot is put into the ground along with the plant, as the roots grow into the pot wall; when moist, they can be pressed or squeezed into any shape desired, making it possible to fit them into pockets or crevices between stones.

The right time for dividing most of the rock plants is immediately after their flowering period. Saxifrages, campanulas, aubrietias, and a host of others are easily handled in this way, the parent plant either being carefully cut or torn apart, a section of the old plant, or rooted runners, being secured for each division.

PROPAGATION BY LAYERING

Many of the rock plants which are of running or of creeping habit, such as the creeping thymes, phlox subulata, and so forth,



may easily be induced to form nice little new plants by the simple process of layering, or fastening down the creeping shoots, first making a slight cut or incision on the under side, and covering with peatmoss and sand. If small pots, two or two-and-a-half inches, filled with this mixture, are placed under the incisions, the new roots will be confined, and nice little ready-potted plants secured, which will stand transplanting readily. The runners may be held in place by a bit of stone, or fastened down with a hairpin, clothespin, or a sizable twig cut with a hook at one end.

PROPAGATION BY CUTTINGS

Many amateurs fail in their efforts to propagate rock plants by means of cuttings, first because they try to make the cuttings from old, hard wood which is worthless for this purpose, and secondly, because they do not provide conditions suitable for inducing the formation of roots.

There are two types of cuttings which will give good results. The first are secured by trimming back, after flowering, plants which are of creeping habit or form mats. This will result in the production of a quantity of new, strong shoots, which may be detached with the fingers by pressing *down* and pulling them off with a bit of the old stem or "heel," often with some roots attached. The soft tips, which would wilt, may be pinched off; the bottom also may be trimmed somewhat with a sharp knife to secure a firm point. These are soft-wood cuttings.

Hard-wood cuttings may be made by removing strong shoots of one season's growth, which have become thoroughly firm or "ripe." Cut the lower end just below a joint, and make the cutting three or four inches long, trimming off the leaves from the lower half.

For rooting the cuttings, ordinary flowerpots may be used, but the types known as azalea pots are better. Four to six inches in diameter is a convenient size to use. Put an inch or so of gravel in the bottom, and then fill in to within a half inch of the top with half sand and half peatmoss, pressed down

firmly. Insert the cuttings, about two inches apart, around the *edge* of the pot.

The pots containing the soft-wood cuttings may be placed in deep saucers to be kept supplied with water: those containing the hard-wood cuttings should be plunged to the rim in cinders, as suggested for divisions above. In either case, they should be kept in the shade and watered frequently enough to prevent the soil from drying out, *but not overwatered*. The soft-wood cuttings should root within a few weeks; the hard-wood ones may root within a few weeks, or take several months. As soon as they have formed roots, they may be potted up individually, or placed in a frame or bed in prepared soil, to make further growth before being set out in the garden.

Hard-wood cuttings made in the autumn may be allowed to remain in the frame over winter, being thoroughly mulched with leaves to prevent their being heaved out, or the cracking of the pots by frost.

For taking up and transplanting rock plants, many of which root very deeply, I have found an asparagus knife—used for cutting this vegetable below ground—most convenient. It also makes an excellent tool for *weeding* in the rock garden: the long narrow blade may be thrust in between stones, cutting the roots of undesired intruders off so far down they will not sprout again, without disturbing any neighboring plant.

CHAPTER XII

SUMMARY: LISTS OF ROCK PLANTS

A NEW type of gardening, like any new subject, seems, when we first come into contact with it, more difficult than it really is. The beginner at rock gardening, receiving his first catalog of rock garden plants, or even scanning the list of rock plants in a general catalog, may feel somewhat overwhelmed by the number of imposing, unfamiliar names, most of which have no English synonyms.

Be not disheartened! As you proceed, the tangle will begin to straighten itself out. The successes will so greatly outnumber any probable failures that the latter will seem insignificant; and both your skill and your enthusiasm will grow with every new plant.

The lists which follow do not begin to cover all the rock plants available, but they provide ample material for a start. Those who wish to follow further the fascinating game of rock gardening will find many other flowers and shrubs described in such works as Mrs. Wilder's entrancing book "Adventures in My Garden and Rock Garden," and Mr. Durand's "Taming the Wildings."

LISTS OF ROCK PLANTS

TWENTY-FIVE EASILY GROWN, FOR GENERAL USE

(Those in CAPITALS are often used in the hardy border, but are excellent in the rock garden.)

Adonis: easily grown, buttercup-like plants.

Ajuga: rampant growers; keep from small plants.

- ALYSSUM:** easy and satisfactory; many varieties; use several.
- Anemone:** species are choice for the rock garden: (Japanese varieties too large).
- ARABIS:** easy and satisfactory; use several sorts.
- Aubrietia:** Rockcress; fine for all purposes; easy from seed.
- Campanula:** many dwarf sorts; indispensable for summer.
- Dianthus:** many species; among the easiest and best of all rock plants.
- Ferns:** all do well, but stick to *small* species except in large gardens.
- Gypsophila:** include repans in your first order; try others.
- Helianthemum:** the "Rock Rose"; evergreen and indispensable for late summer color.
- IBERIS:** Hardy Candytuft; also evergreen and shrubby; a sure bet; both these and the Rock Roses are easy from seed.
- IRIS:** dwarf species, such as *tectorum*, *cristat*, *gracilipes*, *pumila* hybrids, and others.
- Lychnis:** *alpina*, and other dwarf sorts; easy from seed.
- MYOSOTIS:** lovely shades of blue; long flowering and easily grown from seed.
- Nepeta:** Catnip; *mussini* (the true variety) best for the rock garden.
- PHLOX:** dwarf and creeping sorts, such as *subulata* varieties, *amoena*, and *divaricata*.
- PRIMULA:** among the most important groups for the rock garden; one cannot have too many.
- Saponaria:** Soapwort, easily grown and free flowering.
- Saxifraga:** gems of the rock garden; innumerable varieties, all attractive and many most easily grown.
- Sedum:** among the most "rocky" of all rock plants, and successful everywhere if provided sandy soil and full sun.
- Thymus:** the thymes are valued both for their spreading masses of foliage and flowers and their aromatic fragrance; use several.
- Tunica:** clouds of pink flowers, summer and fall; most easily grown.
- Veronica:** blue flowers; easily grown; *repens* is ideal for refined spreading mat.
- VIOLA:** cheeriest of all are the Johnny-jump-ups; easily grown from seed; are the most constant flowering.

TWENTY-SIX ADDITIONAL GENERAL PURPOSE ROCK PLANTS

- Achillea:** *tomentosa*, *sibirica*, and other dwarf sorts; daisy-like flowers.
- Androsace:** beautiful but rather difficult to grow; try first *chumbyi*, *carnea*, and *lactea*.
- AQUILEGIA:** small sorts, such as *alpina* and *canadensis*.
- ARENARIA:** Sandwort; easily grown from seed.
- Armeria:** neat tufts of foliage, and dainty flowers; easy from seed.
- ASPERULA:** *odorata* and others, spreading, rather large for small rock garden.
- Aster:** dwarf sorts only, such as *alpinus*.
- DICENTRA:** *formosa* and *eximia*; splendid, usually less than 12 inches.
- Draba:** small creeping plants with yellow flowers; easy from seed.

- Epimedium:** valuable for foliage all season long.
Erinus: very early pink flowers; sometimes self-sown.
Gentiana: rare, beautiful, desirable—but difficult.
Geranium: delicate lilac, blue or white flowers, worth striving for.
GEUM: heldreichii is hardiest and best for rock garden, unusual orange tone.
HEUCHERA: rather tall, but beautiful; sanguinea splendens is unusually fine.
Houstonia: native "Bluets" or "Quaker Ladies"; acid soil; dainty and charming.
Lavandula nana: will thrive in fullest exposure to sun, and dry soil.
Leontopodium alpinum: the famous Edelweiss, easy to grow but not beautiful.
Mitchella repens: Partridgeberry; give acid leaf mould soil and shade.
PAPAVER: alpinum; nudicaule, Thibetica, are among the small poppies; all easy to grow from seed.
Pentstemon: pubescens; rupicola; alpinus and other dwarf sorts; not difficult from seed.
Polemonium: reptans, bushy but graceful; attractive blue flowers.
Potentilla: cinquefoil; various; light sandy soil; blooms midsummer; vernanana especially good.
POLYANTHUS: Bunch-primrose; vigorous growing; excellent for large rock garden.
SILENE: Catchfly; all good; Schafta blooms in fall.
Sempervivum: cactus-like plants of extreme hardiness; add rock garden character to any planting.

FOR SHADE

(Those in *italics* may be planted in deep shade)

- | | |
|---|--|
| Adonis vernalis. | <i>Mitchella repens</i> (Partridgeberry). |
| Anchusa myosotidiflora. | Mitella diphylla (Bishops-cap). |
| Ajuga—various. | Myosotis palustris. |
| Aquilegia canadensis (columbine). | Phlox divaricata canadensis. |
| Arenaria balearica. | Primula (some varieties in deep shade). |
| Asperula odorata. | Ramondia. |
| Campanula, carpatica, rotundifolia. | Sanguinaria canadensis (Blood-root). |
| Corydalis, lutea and cheilanthesifolia. | Saxifraga, cordifolia, crassifolia. |
| Cypripedium (Ladyslipper). | Shortia galacifolia (Oconee-bells). |
| Dicentra, eximia, formosa, and other native. | Silene, pennsylvanica, virginica. |
| Epigaea repens (Trailing-arbutus). | Thalictrum adiantifolium. |
| Ferns, various. | Trillium, various. |
| Funkia coerulea. | Viola, blanda, canadensis. |
| Hepatica. | |

ROCK GARDENS

FOR WALLS AND BANKS

IN FULL SUN

<i>Achillea tomentosa</i> .	<i>Gypsophila repens</i> .
<i>Alyssum</i> .	<i>Helianthemum</i> .
<i>Arabis alpina</i> .	<i>Iris tectorum</i> .
<i>Arenaria, grandiflora</i> and <i>montana</i> .	<i>Leontopodium alpinum</i> .
<i>Artemisia frigida</i> .	<i>Lychnis alpina</i> .
<i>Aubrietia</i> .	<i>Nepeta mussini</i> .
<i>Campanula garganica</i> .	<i>Phlox subulata</i> , and others.
<i>Cerastium tomentosum</i> .	<i>Polemonium reptans</i> .
<i>Cheiranthus, alpinus</i> and others.	<i>Saponaria ocymoides</i> .
<i>Dianthus deltoides</i> , and others.	<i>Saxifragas</i> , various.
<i>Erinus alpinus</i> .	<i>Sedums</i> .
<i>Geranium ibericum</i> and others.	<i>Sempervivums</i> .

FOR WALLS AND BANKS

<i>Thymus</i> .	<i>Tunica saxifraga</i> .
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IN SHADE, OR FOR NORTHERN EXPOSURE

<i>Arabis alpina</i> .	Ferns, <i>adiantum</i> , <i>aspidium</i> and others.
<i>Asperula odorata</i> .	<i>Geranium robertianum</i> .
<i>Campanula carpatica</i> and <i>rotundifolia</i> .	<i>Iris cristata</i> .
<i>Corydalis cheilanthifolia</i> .	<i>Primula</i> .
<i>Epimedium</i> .	<i>Saxifraga, cordifolia</i> and <i>crassifolia</i> .

FOR PATHS AND WALKS

STONE WALK OR STEPS, WITH WIDE JOINTS

<i>Arenaria balearica, caespitosa</i> .	<i>Herniaria glabra</i> .
<i>Campanula pusilla, rotundifolia</i> .	<i>Linaria pilosa</i> , and others.
<i>Cerastium tomentosum</i> .	<i>Sedum acre</i> , and others.
<i>Corydalis lutea</i> .	<i>Silene pennsylvanica</i> .
<i>Dianthus prichardi</i> .	<i>Thymus</i> , various.
Ferns, in general.	

FOR PAVED PATHS, IN CREVICES

<i>Achillea nana</i> .	<i>Linaria pilosa</i> , and others.
<i>Arenaria, balearica, caespitosa</i> .	<i>Thymus serpyllum</i> .
<i>Draba repans</i> .	<i>Veronica repens, lanuginosus</i> .
<i>Epilobium nummularifolium</i> .	

FOR BOG GARDENS

<i>Ajuga reptans</i> , <i>genevensis</i> .	<i>Mertensia virginica</i> .
<i>Anchusa myosotidiflora</i> .	<i>Myosotis palustris</i> varieties.
<i>Anemone sylvestris</i> .	<i>Primula japonica</i> , <i>vulgaris</i> , and
Ferns, <i>adiantum pedatum</i> , and	others.
others.	<i>Rhexia virginica</i> (Meadow
<i>Iris cristata</i> (with good drain-	Beauty).
age), <i>versicolor</i> .	

PREFERRING LIME SOIL

Most of the rock plants will grow satisfactorily in a neutral or slightly acid soil (see page 44). Among those which like more lime are the following:

Androsace villosa.
Anemone, *hepatica*, *pulsatilla*, *alpina*.
Aquilegia alpina.
Aubrietias.
Campanula pusilla.
Daphne cneorum.
Dianthus, *alpinus*, *aizoides*.
Erica carnea.
Erinus alpinus.
Gypsophila repens.
Leontopodium.
Saxifraga, *aizoon*, *macnibiana*, *crustata*, and other
 "encrusted" varieties generally; also the "cushion"
 sorts, which prefer moraine conditions; the "Mos-
 sies" like acid soil.
Silene acaulis.
Wahlenbergias (*cervicina*) Harebells or Rockbells.

ANNUALS

While the rock garden is naturally a garden of hardy plants, there are occasions when the annuals and tender perennials may advantageously be used, especially for the first season. Among those which lend themselves to this purpose are the following:

Abronia umbellata (Sand verbena): low trailing plants with violet flowers.
Alyssum maritimum for trailing; compact sorts for individual plants.
Anagallis (Pimpernel): 8"; *grandiflorus* blooms July to hard frost.
Asperula (Woodruff): sun or shade; blue; often self-sows.
Dianthus (Annual Pink): similar to hardy types; grow anywhere.
Diascia barberae: 15" or so, with graceful spikes of Columbine-like flowers.

- Dimorphotheca* (African Golden Daisy): 12"; dwarf daisy-like blossoms.
- Eschscholtzia* (California-Poppies): *tenuifolia* is a miniature type most attractive.
- Gypsophila*: *muralis* is trailing variety, 6 to 8", flowers from mid-summer to frost.
- Linum Rubrum* (Scarlet Flax): 8 to 12"; full sun; brilliant crimson flowers; blooms until frost.
- Malcomia maritima* (Virginia Stocks): 6"; dainty little "stocks" of rose and red shades, also pure white.
- Maritima candidissima* (Dusty-Miller): creeping, gray foliage plant of good "rock" character.
- Mesembryanthemum crystallinum* (Iceplant): trailing, 8" high; distinctly of rock garden character.
- Nemophila insignis* (Baby-Blue-eyes): trailing habit; skyblue flowers throughout mid-summer; semi-shade.
- Phlox Drummondii*: Dwarf varieties but 6" tall; Star Phlox (*Cuspidata*) particularly effective.
- Portulaca* (Moss Rose): spreading habit; brilliant colors; thrives in dryest soil; beautiful moss-like foliage.
- Sanvitalia*: trailing, with yellow flowers in great profusion.
- Saponaria calabrica* (Annual Soapwort): tuft-like growth, with pink blossoms.
- Tagetes signata pumila*: charming dwarf marigold, forming mound-like plants 8 to 9" high; yellow flowers in great profusion.
- Verbena hybrida*: especially good for masses of color in late autumn; vigorous growth.

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